Journal of Consulting and Clinical Psychology
1995, Vol. 63, No. 6, 1005-1014

0022-006X/95/$3.00

A Randomized Trial of Self-Help Materials, Personalized Feedback, and Telephone Counseling With Nonvolunteer Smokers

Susan J. Curry and Colleen McBride
Group Health Cooperative of Puget Sound
and University of Washington

Louis C. Grothaus and Doug Louie
Group Health Cooperative of Puget Sound

Edward H. Wagner
Group Health Cooperative of Puget Sound and University of Washington

The incremental effects of (a) a self-help booklet alone, (b) self-help booklet with computer-generated personalized feedback, and (c) self-help booklet, personalized feedback, and outreach telephone counseling were evaluated in a population-based, nonvolunteer sample of smokers. Smokers (N = 1,137) were identified through a telephone survey of a random sample of 5,903 enrollees in a health maintenance organization and randomized to a no-treatment control group or 1 of the 3 intervention conditions. Smoking status was ascertained 3, 12, and 21 months postrandomization. Cotinine validation of self-reported cessation was obtained at the 12-month follow-up. Overall, the telephone counseling significantly increased smoking cessation at the 3-month follow-up, but not at 12 or 21 months. Among smokers who were precontemplative at baseline, telephone counseling significantly increased prevalent abstinence at 3 and 12 months and continuous abstinence at 21 months (defined as self-reported abstinence at 3, 12, and 21 months).

Cigarette smoking continues to be the primary cause of premature morbidity and mortality in the United States (U.S. Department of Health and Human Services, 1990). Interest among smokers in quitting remains high; population-based estimates are that between one half and two thirds of smokers are seriously considering quitting within the next 6 months (U.S. Department of Health and Human Services, 1990). National surveys find that the majority of smokers prefer assistance in the form of self-help programs (Fiore et al., 1990).

There is increasing evidence for the efficacy of self-help manuals for smoking cessation. Use of self-help materials is consistently associated with higher abstinence rates at initial and long-term follow-ups (Curry, 1993). Quit rates for smokers who use self-help materials (i.e., actively engage in suggested activities as distinct from simply reading the manuals) are comparable with those of smokers who participate in more intensive group programs (Curry, 1993).

Unfortunately, the full potential of self-help materials may not be appreciated because both the characteristics of smokers who request these materials and their rates of use have been less than optimal. Smokers who request self-help programs are older, more addicted smokers who have a harder time quitting (Wagner, Schoenbach, Orleans, Grothaus, Saunders, Curry, & Pearson, 1990). Between 50% and 80% of smokers who request self-help materials fail to complete any of the suggested activities. This suggests two areas for further research—assessment of the impact of motivational adjuncts on use of self-help materials and smoking cessation, and evaluation of self-help programs using less self-selected populations.

Several studies support the efficacy of written personalized feedback and outreach telephone counseling as motivational adjuncts to self-help materials. In our previous work, we found that computer-generated personalized feedback, designed to enhance smokers' confidence in their ability to successfully use a self-help program, significantly increased rates of program use, initial cessation and long-term abstinence (Curry, Wagner, & Grothaus, 1991). Further analyses indicated that the feedback's effect on initial cessation was primarily among smokers with medium- to low-baseline levels of confidence in their ability to quit smoking (Curry, Louie, Grothaus, & Wagner, 1992). Personalized feedback reports, based on the Transtheoretical Model of Change (Prochaska & DiClemente, 1983) have also significantly increased cessation among users of self-help materials (Prochaska, DiClemente, Velicer, & Rossi, 1993). Analyses by stage of cessation indicated that the feedback reports had their biggest impact on smokers in the later stages of cessation.

Among studies of telephone counseling, Orleans et al. found

Susan J. Curry, Colleen McBride, and Edward H. Wagner, Group Health Cooperative of Puget Sound, Seattle, Washington, and Department of Psychology, University of Washington; Louis C. Grothaus and Doug Louie, Group Health Cooperative of Puget Sound, Seattle, Washington.

Portions of this article were presented in July 1992 at the Second International Congress of Behavioral Medicine, Hamburg, Germany, and in April 1994 at the 15th Annual Meeting of the Society of Behavioral Medicine, Boston.

This research was supported by National Institute on Drug Abuse Grant RO1 DA04447.

We thank Holly Kuna, Angela Salazar, Peggy Tobin, Brian Russell, Bonner Reinking, and Chester Pabiniak for their assistance in conducting this research. We also thank Ellen Gritz, Carlo DiClemente, and Saul Shiffman for helpful consultation at the start of this project.

Correspondence concerning this article should be addressed to Susan J. Curry, who is now at the Center for Health Studies, Group Health Cooperative, 1730 Minor Avenue, Suite 1600, Seattle, Washington 98101.

that four counselor-initiated telephone calls along with a self-help booklet resulted in significantly higher short- and long-term cessation rates, compared with the self-help manual alone (Orleans et al., 1991). Smokers who received the telephone counseling had the highest rates of use of the self-help materials, a likely mediator of the cessation outcomes. Other studies reported significantly higher quit rates with telephone counseling adjuncts to self-help materials at earlier, but not later, follow-ups (Lando, Hellerstedt, Pirie & McGovern, 1992; Orleans & Rimer, 1992; Prochaska et al., 1993).

With the exception of Lando et al.'s study, all of the evaluations of personalized feedback and telephone counseling have been conducted with motivated smokers who volunteer for treatment. Lando et al. identified a sample of smokers through random-digit dialing but only intervened with approximately 50%, who said they were interested in treatment. In a recent innovative population-based study, Gritz et al. (Gritz, Berman, Bastani, & Wu, 1992) randomized female enrollees in a health maintenance organization to receive a six-part self-help manual or to a no-intervention control group. The smokers were identified through health behavior surveys conducted with a random sample of female enrollees. Although the female smokers voluntarily completed the health surveys, they were not recruited for a smoking cessation intervention trial. In Gritz et al.'s study, the self-help manual alone did not significantly improve quit rates, compared with the control group.

The purpose of this study was to extend our work on self-help interventions with personalized motivational adjuncts into a nonvolunteer, population-based sample of smokers. In a randomized controlled trial, we evaluated the incremental effects of using the self-help booklet alone; the self-help booklet with computer-generated personalized feedback; and the self-help booklet, personalized feedback, and outreach telephone counseling in comparison with a no-treatment control group.

Method

Participants

Identification of a population-based sample of smokers. Smokers were identified through a telephone survey conducted with a random sample of 8,013 enrollees in the Group Health Cooperative of Puget Sound, a large health maintenance organization (HMO) in Washington with over 450,000 enrollees. A total of 5,903 enrollees completed a health behavior survey (74% response rate; 11% refused to be interviewed, 8% were not reached after at least 7 attempts, and 7% had incorrect telephone numbers), of whom 1,137 reported current smoking (19.4%). All respondents to the survey consented to complete up to three telephone surveys over a 12-month period and were told that they "may receive written health care materials and a call from a health educator." (Because our identification of smokers was completed earlier than anticipated, we were able to add a 21-month follow-up. Separate consent to participate in this follow-up was obtained.)

Randomization. Smokers were randomized to one of four groups: (a) control (n = 328), who received no intervention materials; (b) booklet (n = 330), who received a self-help booklet only; (c) feedback (n = 329), who received the self-help booklet along with computer-generated personalized feedback; and (d) phone (n = 150), who received the self-help manual, personalized feedback, and up to three counselor-initiated telephone calls. Resource constraints precluded randomization of more than 150 smokers to the telephone counseling condition. This sample size provided 80% power to detect a 10% increase in initial abstinence and an 8% increase in long-term abstinence (defined as prevalent abstinence at 3 months and continuous abstinence between 3 and 12 months, respectively, and computed assuming comparison rates of 10% and 5%, respectively, in the control group). We considered a 10% difference from the control group to be the minimally acceptable clinical difference to offset the additional expense of outreach telephone counseling calls.

Interventions

Self-help manual. *Breaking Away*, a self-help program for smoking cessation was the self-help booklet sent to participants in the three intervention groups (Curry, Gordon, & Marlatt, 1987). The booklet consists of eight units that can be completed on a week-by-week basis and includes components for smokers at all stages of readiness to quit. The first two units focus on exploring motivations and concerns about quitting (relevant to the precontemplation and contemplation stages); Units 3 and 4 focus on changing smoking patterns, enlisting social support, practicing stress reduction, and planning pleasurable alternatives to smoking (relevant to the preparation stage); Units 5 through 8 focus on achieving initial cessation and learning relapse prevention strategies (relevant to the action and maintenance stages).

Personalized feedback. The personalized feedback was adapted from a previous evaluation of self-help interventions and motivational strategies conducted with volunteer smokers (Curry, Wagner, & Grothaus, 1991). The feedback was generated by computer, based on data obtained from the baseline survey. It was based on previous research on enhancing self-efficacy (Bandura & Cervone, 1983; Bandura & Schunk, 1981) and on work showing that intrinsic motivation to stop smoking focused on two dimensions—health concerns and self-control (Curry et al., 1990). Enhancing self-confidence and motivation was approached by highlighting (a) similarities between smokers' previous experience and their reasons for quitting and (b) the experience and motivations of successful quitters. The messages were framed to take into account the smokers' stage of readiness to quit smoking. The feedback consisted of: (a) a cover letter that acknowledged the smoker's baseline stage of readiness to quit smoking; (b) a handwritten form that summarized the information from their baseline survey and formed the basis for the personalized analysis; (c) a personal analysis of items from the baseline survey regarding their smoking and quitting history (number of earlier quit attempts, longest previous abstinence, and previous participation in cessation programs), as well as their health concerns and desire for self-control as intrinsic motivation dimensions; and (d) a "getting started" list of potential concerns and places in the self-help booklet that addressed the concerns. This list varied depending on the smoker's baseline stage of readiness to quit.

Telephone counseling protocol. The telephone counseling intervention was designed to be completed during the 3 months after the smokers' receipt of the written self-help materials. The first counseling call occurred 2 weeks after the *Breaking Away* booklet was mailed. The second call occurred 4 weeks after the first call, and the third call occurred 4 weeks after the second call. The second and third calls could be scheduled with some flexibility at the request of the participant. The counselors made five attempts during different times of the day and different days of the week over a 2-week period before ending contact attempts.

Two counselors conducted the telephone counseling. Both counselors (one male, one female) were experienced in individual health counseling. Smokers were assigned to the counselors on a random basis; they were not matched by gender. The counselors were trained by Susan J. Curry, and the training involved role playing counseling scenarios, listening in on each other's actual calls, and debriefing sessions after pilot calls. Counselors provided weekly summaries of their activities and participated in group supervisory meetings.

The telephone counselors worked with a manual that included detailed protocols for each call. The overall objective was to encourage and assist smokers to use the self-help materials and to reinforce the confidence-boosting messages contained in the personalized feedback. In addition to the telephone counseling manual, counselors had access to the smokers' baseline staging and smoking history data as well as a copy of the personalized feedback that was sent with the self-help booklet. Each counselor also received a "flip-card" file with information about and specific references to pages in the self-help booklet for 15 topics (e.g., benefits of quitting, fear of failure, withdrawal, nicotine replacement, stress, weight gain, referrals for more intensive treatment).

The format for the calls was open-ended. Smokers were staged at the start of each call, and the call script was tailored to be appropriate to their stage. Smokers were asked about their use of the self-help materials and whether they had any concerns or questions about quitting smoking. The counselors attempted to end each call with a confidence-boosting message and a recommendation to complete a specific activity in the self-help manual. At the end of the first and second counselor calls, the counselor also requested permission to make a subsequent call. Counselors completed standardized summary sheets for each call. A detailed description of the data from these summary sheets has been reported elsewhere (Britt et al., 1994).

Measures

Baseline questionnaire. The health behavior screening survey provided the baseline data. The baseline questionnaire assessed demographics (age, sex, education, marital status, employment status, income), smoking history (stage of cessation, age at smoking onset, number of years of smoking, baseline smoking rate, number of previous quit attempts, longest previous period of abstinence from cigarettes, and physical dependence), motivation, perceived health, and perceived stress.

Follow-up. Use of the self-help materials and smoking status were assessed by telephone surveys 3, 12, and 21 months after randomization. Number of quit attempts, longest period of abstinence, and type of motivation for quitting were reassessed at the 3-, 12-, and 21-month follow-ups. Perceived stress was reassessed at the 12- and 21-month follow-ups. Response rates at each follow-up were 91% (3 months); 97% (12 months) and 76% (21 months). Overall, 88% of the participants provided data at 3 and 12 months, and 67% provided follow-up data at 3, 12, and 21 months. There were no significant differences among the four study groups in response rates at any of the follow-ups (p values for tests of proportions responding at the 3-, 12-, and 21-month follow-ups were .85, .95, and .68, respectively). Participants who received the self-help booklet indicated how much of the booklet they read (did not read, skimmed it, read part of it, read most of it, or read all of it) and how many of the recommended exercises they completed (none, one or two, three or four, or more than four).

Saliva cotinine. The introduction to all follow-up surveys included the statement, "Participants who report that they have quit smoking may be asked to provide a saliva sample to verify biochemical changes associated with smoking cessation." All participants who reported abstinence at the 12-month follow-up were contacted within 1 week of their interview to arrange for obtaining a saliva sample. We attempted in-person collection for all participants who lived within a 25-mile (40.23-km) radius (defined on the basis of zip code) of the Center for Health Studies. Participants who lived outside of our in-person collection area were asked to provide a sample by mail. All obtained samples were frozen and shipped, on dry ice, to the American Health Foundation for analysis.

Statistical Analysis

We compared the baseline characteristics of the four randomized groups using chi-square tests for discrete variables and F tests for continuous and ordinal variables (e.g., income). For all outcomes, the first analytic step was an overall chi-square test for differences in proportions among the four study groups. If the p value for the overall test was $<.05$, then pairwise comparisons of each intervention group with the control group were conducted in a logistic regression analysis. For all binary outcome variables, an additional logistic model was constructed comparing the four intervention groups controlling for all of the participant characteristics reported in Table 1. Because the intervention effects estimated with the adjusted analyses replicated the estimates from the unadjusted models, the results are reported for the unadjusted analyses. When data on smoking status was missing for a participant because of nonresponse, either to a follow-up survey or to that item, the participant was included in the analysis with status set equal to smoker. We replicated our outcome analyses using only those participants who provided follow-up data, and the results were unchanged (although prevalent abstinence estimates were higher at the later follow-ups because of increasing proportions of nonrespondents). We also used multivariate logistic regression to identify which baseline characteristics predicted 7-day abstinence at 3, 12, and 21 months.

Results

Participant Characteristics

Table 1 summarizes the characteristics of participants overall and in each study group. With the exception of number of previous quit attempts, there were no significant differences across the four groups. Pairwise comparisons of the average number of previous quit attempts indicated that participants in the feedback group reported significantly fewer previous attempts than the other three groups. Just over half of our sample was female (52%); the average age was 41.1 years (SD = 11.5); 62% were married or living with a partner; 91% were high school graduates; 76% were employed full-time. Participants smoked an average of 17.3 cigarettes per day (SD = 10.6), began smoking at an average age of 18.2 years (SD = 4.5), and averaged 3.6 previous quit attempts (SD = 5.1). Thirty-eight percent had previously quit for at least 6 months, 70% had quit for 24 hr in the past year, 54% had used some form of previous treatment for smoking cessation (includes self-help manuals, group treatment, individual therapy, and nicotine replacement). The distribution of smokers across stages of readiness to quit was 39% precontemplation (not seriously considering quitting in the next 6 months), 41% contemplation (seriously considering quitting in the next 6 months), and 20% preparation (planning to quit in the next 30 days).

Participation in the Intervention

We compared rates of program use among the three intervention groups as reported at the 3-month follow-up. As summarized in Table 2, there were significant differences in the proportions of participants who, at the 3-month follow-up, recalled having received the *Breaking Away* booklet. Overall, 82% recalled receiving the booklet. However, compared with the booklet-only group and the telephone counseling group, significantly fewer participants in the booklet-plus-feedback group reported receiving the booklet. There were no significant differences among the proportions of participants in the three intervention groups who remembered receiving the booklet who reported that they had read some, most or all of the materials. However,

Table 1
Participant Characteristics

Characteristic	Total (N = 1,137)	Treatment group: Control (n = 328)	Booklet (n = 330)	Feedback (n = 329)	Phone (n = 150)	p
Demographics						
% female	52	48	53	53	59	.17
Age						
M	41.1	41.2	41.3	40.9	40.8	.94
SD	11.5	11.9	11.5	11.1	11.9	
% who finished high school	91	92	91	92	89	.43
% income >$25,000	73	70	76	73	75	.43
% married	62	61	64	58	64	.86
% employed full-time	76	78	75	76	73	.72
% White	87	87	89	86	86	.54
Smoking history						
No. cigarettes/day						
M	17.3	17.1	17.2	17.7	17.1	.89
SD	10.6	10.3	10.5	11.1	10.1	
Age began smoking						
M	18.2	17.9	18.1	18.6	18.2	.20
SD	4.5	4.8	4.1	4.7	5.0	
% who smoke within 15 min of waking	52	53	50	51	60	.13
No. of serious quit attempts						
M	3.6	3.9	3.6	2.9	4.2	.01
SD	5.1	5.3	4.8	4.6	6.1	
% with previous abstinence >6 months	38	36	39	39	37	.71
% who quit for 24 hr in past year	70	71	71	70	64	.34
% who used previous treatment	54	52	56	55	55	.70
Desire to quit						
M	5.6	5.7	5.5	5.6	5.5	.82
SD	2.9	2.9	2.9	2.9	3.0	
Stage of readiness to quit smoking (%)						
Precontemplation	39	37	38	40	43	
Contemplation	41	41	40	41	43	
Preparation	20	22	21	19	15	.60[a]
Type of motivation						
Health concerns						
M	2.3	2.4	2.3	2.3	2.3	.95
SD	1.1	1.1	1.0	1.1	1.1	
Self-control						
M	1.4	1.4	1.4	1.3	1.4	.59
SD	1.2	1.1	1.0	1.1	1.2	
Reinforcement						
M	1.4	1.4	1.5	1.4	1.5	.38
SD	1.0	1.0	1.0	1.0	1.1	
Social influence						
M	0.6	0.6	0.6	0.6	0.7	.72
SD	0.7	0.7	0.7	0.7	0.6	

[a] p value tests if the distribution over three stages differs between the four treatment groups (p value from a chi-square test in which the degrees of freedom were 6).

self-reported completion of program activities was significantly higher in the telephone counseling group. At the 12-month follow-up, 73% of those who remembered receiving the booklet at 3 months reported that they still had it; this percentage fell to 63% at the 21-month follow-up.

A detailed analysis of rates of participation in the telephone counseling is presented by Britt et al. (1994). Briefly, over two thirds of the smokers who were randomized to the telephone counseling intervention completed 3 counseling calls; nearly 90% completed at least one call. Rates of participation did not differ by baseline stage of change.

Smoking Cessation

Table 3 summarizes comparisons of the four groups regarding quit attempts (defined as one or more self-reported "serious attempts to quit smoking" during the follow-up period), 24-hr cessation (defined as self-reported abstinence for at least 24 hr during the follow-up period), prevalent abstinence (defined as 7 or more days of abstinence at the time of follow-up) and continuous abstinence between follow-up periods. As indicated in the table, the four groups differed significantly only with regard to prevalent abstinence at the 3-month follow-up. At 3 months, a significantly

Table 2
Use of the Self-Help Booklet by Intervention Group

Variable	Treatment group: Booklet (n = 330)	Feedback (n = 329)	Phone (n = 150)	p	Overall (N = 809)
At the 3-month follow-up					
% who recalled booklet[a]	85	79	88	.03	83
% who read booklet[b]	39	40	42	.77	40
% who rated booklet as somewhat or very useful[c]	60	62	68	.62	62
% who completed one or more program activities[d]	20	18	29	.03	21
At the 12-month follow-up					
% who had booklet[e]	71	74	77	.56	73
At the 21-month follow-up					
% who had booklet[e]	63	62	66	.82	63

[a] Missing data were coded as not received. [b] Data reported for participants who recalled receiving booklet; missing data were coded as not read. [c] Data reported for participants who read the booklet. [d] Data reported for participants who recalled receiving booklet; missing data were coded as not completed 1+ activities. [e] Among respondents who recalled receiving booklet at 3-month follow-up.

higher proportion of participants who received the telephone counseling reported abstaining for at least 7 days. Across all four groups, half of the sample had made a serious attempt to quit and nearly half had managed to quit for 24 hr by the 21-month follow-up. Prevalent abstinence rates increased over time, with a 50% increase between 3 and 12 months and a 33% increase between 12 and 21 months.

Table 4 summarizes prevalent and continuous abstinence rates by baseline stage of readiness to quit across the four study groups. Prevalent abstinence at 3, 12, and 21 months differed significantly by baseline stage of readiness to quit, with smokers at more advanced stages more likely to be abstinent ($p < .0001$, .0001, and .02, respectively). The highest success rates were reported by participants in the preparation stage who received the telephone counseling. Their 9% continuous abstinence rate between 3 and 21 months is 50% higher than the median continuous abstinence rate reported by Cohen et al. (1989) for volunteer smokers who participated in prospective studies of self-help interventions. Unanticipated findings are the significant effects for telephone counseling among precontemplative smokers (i.e., those who indicated at baseline that they were not seriously considering quitting in the next 6 months). It appears that the telephone counseling effect at the 3-month follow-up was due, in a large part, to a tripling of the abstinence rates among smokers who were precontemplators at baseline (9% abstinent in the telephone counseling group vs. 2% to 3% in the other groups, $\chi^2(3, N = 436) = 8.52$, $p < .05$. Their prevalent abstinence rates were nearly triple that of the other three groups at 12 months. Continuous abstinence from 3 to 21 months was also significantly higher among precontemplators in the telephone counseling group (5% vs. 1%).

Saliva Cotinine

Collecting saliva at the 12-month follow-up was challenging because participants had neither explicitly volunteered for a

Table 3
Smoking Cessation Outcomes Across Treatment Groups

Outcome[a]	Treatment group: Control (n = 328)	Booklet (n = 330)	Feedback (n = 329)	Phone (n = 150)	p	Overall (N = 1,137)
Ever attempted to quit (%)[b]	49	50	48	53	.80	49
Ever quit for 24 hr (%)[b]	43	46	44	48	.71	45
Prevalent abstinence (%)						
3 months	6	5	4	11	.02	6
12 months	11	7	9	11	.34	9
21 months	13	11	10	15	.36	12
Continuous abstinence (%)						
3–12 months	3	2	3	5	.29	3
12–21 months	6	4	4	7	.37	5
3, 12, and 21 months	2	1	2	4	.23	2

[a] Missing data coded as smoking. [b] "Ever" = between baseline and 21-month follow-up.

Table 4
Smoking Cessation by Treatment Group by Baseline Stage of Readiness to Quit Smoking

Baseline stage	Treatment group: Control[a] (n = 324)	Booklet[b] (n = 327)	Feedback[c] (n = 323)	Phone[d] (n = 150)	p[e]	Overall (N = 1,137)
7-day abstinence at 3 months (%)						
Precontemplation	3	2	2	9	.04	3
Contemplation	4	6	4	8	.52	5
Preparation	14	11	6	23	.20	12
7-day abstinence at 12 months (%)						
Precontemplation	7	3	4	16	.005	7
Comtemplation	8	8	12	3	.22	9
Preparation	21	11	14	23	.35	16
7-day abstinence at 21 months (%)						
Precontemplation	13	10	5	16	.07	10
Contemplation	11	10	12	11	.95	11
Preparation	18	15	16	23	.86	17
Abstinent at 3 and 12 months (%)						
Precontemplation	1	1	2	5	.19	2
Contemplation	2	3	3	2	.77	2
Preparation	8	3	6	18	.09	7
Abstinent at 3, 12, and 21 months (%)						
Precontemplation	1	0	1	5	.03	1
Contemplation	1	0.5	2	2	.80	1.5
Preparation	6	3	3	9	.56	4

[a] Precontemplation (n = 119); contemplation (n = 133); preparation (n = 72). [b] Precontemplation (n = 125); contemplation (n = 131); preparation (n = 71). [c] Precontemplation (n = 128); contemplation (n = 132); preparation (n = 63). [d] Precontemplation (n = 64); contemplation (n = 64); preparation (n = 22). [e] From chi-square test (df = 3) to compare abstinence rates between treatment groups.

study of smoking behavior nor requested treatment for smoking cessation. We did not want to offend our nonvolunteer participants by suggesting that we needed to obtain saliva samples to ensure they were telling the truth. Furthermore, because participation did not involve any in-person visits to the study site, our participants were dispersed over a wide geographic area. We approached these challenges by telling participants that the saliva sample would be used to verify biochemical changes associated with smoking cessation and by arranging for collection of saliva by mail from participants who lived outside of a 25-mile (40.23-km) radius from our study office. Nearly half of our sample (48%) lived outside of the in-person collection area. Rates of compliance with saliva collection and rates of positive cotinine values did not differ by geographic location. Overall, 49% of the saliva samples were obtained in person and 51% by mail. Table 5 summarizes the results of the saliva collection and cotinine analyses for in-person and mailed samples combined. Nearly one fourth of those contacted refused to provide a saliva sample, and we were unable to reach an additional 8%. Among those who did provide a saliva sample, the disconfirmation rate averaged 10%. Although there were no statistically significant differences in the percentages of positive cotinine values by study group, the control group had the largest rate (21%). Defining disconfirmation of abstinence as refusal, no-contact or positive cotinine values, 43% lacked biochemical validation of self-reported abstinence. The majority of nonconfirmed cases resulted from lack of cooperation by participants. The disconfirmation rate did not differ across study groups, $\chi^2(3, N = 105) = 0.44, p > .90$.

Stage of Readiness to Quit

Because the majority of participants were smoking at each follow-up, we also tested whether the interventions had any effect on continuing smokers' stage of readiness to quit. For each consecutive follow-up period (i.e., baseline to 3 months, 3 to 12 months, and 12 to 21 months), respondents who reported smoking and who provided complete data on their stage of readiness to quit smoking were classified into one of three categories. The *improved* stage indicates movement forward in readiness to quit (e.g., from precontemplation to contemplation or preparation). The *same* stage indicates no change. The *worse* stage indicates movement backward in readiness to quit (e.g., from preparation to contemplation).

As summarized in Table 6, there was a significant effect between baseline and 3 months, but no differences at the other follow-ups. The 3-month effect is reflected primarily in a much smaller percentage of smokers in the telephone counseling condition whose stage changed for the worse (11% vs. >20% in the other three groups). There was a fair amount of movement between stages over the course of the 21-month follow-up. Only slightly more than half of the smokers remained at the same stage between consecutive follow-ups, and, among smokers, movement to a worse stage was more common.

Participant Characteristics Associated With Prevalent Abstinence

In addition to an evaluation of the effect of self-help interventions in a sample of nonvolunteer smokers, the characteristics

Table 5
Results From Attempted Cotinine Verification of Smoking Status at the 12-Month Follow-Up

Collection result for participants abstinent 1 week or more	Treatment group: Control (n = 34)		Booklet (n = 23)		Feedback (n = 31)		Telephone (n = 17)		Total (N = 105)	
	n	%	n	%	n	%	n	%	n	%
Refused–relapsed[a]	3	9	7	30	11	35	5	29	26	25
No contact	3	9	2	9	3	10	0	0	8	8
Provided saliva sample	28	82	14	61	17	55	12	71	71	68
Cotinine value >20 ng/ml	6	21	3	21	1	3	1	6	11	10
Disconfirmation[b]	12	35	12	52	15	48	6	35	45	43

[a] Two participants reported relapsing, 1 in the booklet group and 1 in the feedback group. [b] Disconfirmation equals total of (a) refused–relapsed; (b) no contact; (c) cotinine value >20 ng/ml.

of smokers that are associated with smoking cessation can be examined. Here we focus on baseline characteristics as predictors of abstinence at the 3-, 12-, and 21-month follow-ups. Multivariate logistic analyses, with the baseline characteristics summarized in Table 1 as the independent variables and 3-, 12-, and 21-month smoking status as dependent variables were conducted. Table 7 summarizes the regression coefficients and their standard errors from the analyses of the predictors of 3-, 12-, and 21-month smoking status for participant characteristics with multivariate p values < .10 at the 3-, 12-, or 21-month follow-ups.

There was some consistency in predictors of abstinence over time. Nearly all of the predictors of 12- and 21-month abstinence also predicted 3-month abstinence; however the direction of two of the associations reversed over time. At 3 months, compared with smokers, abstainers were younger (39 vs. 41 years), had lower baseline smoking rates (10 vs. 17 cigarettes per day), were more likely to have abstained for 6 months or more during a previous quit attempt (58% vs. 37%), were less likely to have participated in a previous treatment program (43% vs. 55%), were less likely to be in the precontemplation stage of readiness to quit (23% vs. 40%), expressed a stronger desire to quit on a scale ranging from 1 to 10 points (7.0 vs. 5.5), and had higher levels of intrinsic relative to extrinsic motivation (1.1 vs. 0.8). Baseline smoking rate, longest previous abstinence and baseline stage of readiness to quit were also significant predictors of ab-

Table 6
Changes Over Time in Stage of Readiness to Quit Smoking by Treatment Group Among Participants Who Did Not Quit Smoking

Change in stage of readiness to quit	Treatment group[a]: Control	Booklet	Feedback	Phone	p	Overall[b]
Baseline to 3 months (%)					<.05[c]	
Improved[d]	19	15	20	23		19
Same[e]	58	59	58	66		59
Worse[f]	23	26	22	11		22
3 to 12 months (%)					<.19	
Improved	12	14	14	7		13
Same	52	57	55	52		54
Worse	36	29	31	41		33
12 to 21 months (%)					<.36	
Improved	25	27	19	23		24
Same	51	50	54	61		53
Worse	24	23	27	16		23

[a] For the control, booklet, feedback, and phone groups *n*s were as follows: At baseline to 3 months, *n*s were 280, 280, 289, and 118, respectively; at 3 to 12 months, *n*s were 233, 241, 242, and 104, respectively; at 12 to 21 months, *n*s were 178, 174, 185, and 70, respectively. [b] Denominators include participants who provided data on stage and smoking status at both of two follow-ups of interest. [c] p value compares the distribution across the three categories (improved, same, worse) among the four groups from a chi-square test (df = 6). [d] Improved = change during follow-up interval (a) from precontemplation to contemplation or preparation or (b) from contemplation to preparation. [e] Same = no change in stage from previous follow-up. [f] Worse = change during follow-up interval (a) from contemplation to precontemplation, (b) from preparation to contemplation, (c) from preparation to precontemplation, or (d) from abstinent to smoking at any stage.

Table 7
Logistic Regression Coefficients and Standard Errors for Significant Baseline Predictors of 3-, 12-, and 21-Month Abstinence

Predictor	3-month abstinence		12-month abstinence		21-month abstinence	
	β	*SE*	*β*	*SE*	*β*	*SE*
Age (in years)	−.025	.014	−.008	.011	.017*	.009
Income (ordinal, 7 levels)	.073	.111	.034	.090	.154**	.080
Baseline smoking (No. of cigarettes/day)	−.068***	.022	−.066****	.018	−.031**	.013
No. of serious tries (coded 0, 1, 2. . .)	.030	.024	−.004	.023	−.07**	.032
Longest previous abstinence (ordinal, 6 levels)	.312***	.107	.309****	.083	.272****	.071
Previous treatment (0 = no; 1 = yes)	−.718**	.317	.041	.250	.403*	.223
Stage (ordinal, 3 levels)	.437*	.244	.370**	.194	.314*	.172
Desire to quit (scale ranging from 1 to 10)	.114*	.070	.041	.055	.036	.047
Intrinsic–Extrinsic (difference score)	.305*	.182	.142	.147	.070	.132

Note. All predictors from baseline survey. The table lists any variable which was significant ($p < .10$) in one or more of the three multivariate logistic regression models (one for each follow-up), all of which included the following variables: treatment group represented by dummy variables for booklet, feedback, and telephone counseling, sex, age, education, income, marital status, employment, race, baseline smoking rate, age began smoking, time to first cigarette of the day, number of serious quit attempts, longest previous abstinence, quit for 24 hr in the past year, participation in previous treatment, desire to quit, stage of readiness to quit, desire to quit, intrinsic minus extrinsic motivation. Coefficients and *p* values are adjusted for all other variables in the model.
* $p < .10$. ** $p < .05$. *** $p < .01$. **** $p < .001$.

stinence at 12 and 21 months. In addition, older age (43 vs. 41 years), a larger number of previous serious quit attempts, more participation in previous treatment (60% vs. 54%) and household incomes >$35,000/year were predictors of abstinence at 21 months. As indicated by the direction of the parameter estimates, the relationship to abstinence of age and participation in previous treatment reversed between the 3- and 21-month follow-ups, whereas the other associations remained in the same direction.

Discussion

The principle aim of this study was to evaluate state-of-the-art self-help materials and personalized adjuncts in a population-based, nonvolunteer sample of smokers. Identification of our smoker sample through telephone surveys with a random sample of Group Health enrollees did yield a sample of smokers that is different from samples who typically volunteer for intervention studies (cf. Wagner et al., 1991). Compared with Group Health enrollees who had volunteered for a previous evaluation of self-help interventions (Curry et al., 1991), this nonvolunteer sample included significantly more male smokers (47 vs. 36%), was significantly younger (41 vs. 44 years), and smoked significantly fewer cigarettes per day (18 vs. 25 cigarettes). It is noteworthy that the gender, age, and smoking rate of our Group Health volunteer sample is consistent with those of participants who volunteered for 10 studies of unaided quitting that were reviewed by Cohen et al. (1989).

Although participants in this study did not specifically request help for smoking cessation, they were notably receptive to the interventions. The vast majority of participants remembered receiving the written materials, two thirds kept the self-help booklets for nearly 2 years, and a respectable proportion read and did something with them. Almost all of the participants in the telephone counseling condition completed at least one telephone counseling call; the tone of the calls was friendly, and the majority of smokers who completed one call went on to complete two additional calls. Initially, this receptivity appeared to pay off. The telephone counseling intervention significantly increased abstinence rates at the 3-month follow-up, however, the long-term results were less encouraging. None of the intervention components, alone or in combination, resulted in higher quit rates at 12 or 21 months compared with the no-treatment control group. These findings are consistent with other nonvolunteer trials, including that of Gritz et al. (1992), who found no short- or long-term improvements in cessation rates with written self-help manuals and that of Lando et al. (1992), who demonstrated a short-term effect for outreach telephone counseling and written materials but no long-term effects at an 18-month follow-up.

The lack of significant intervention effects at 12 and 21 months needs to be interpreted in the context of the rather impressive abstinence rates in the no-treatment control group. Among smokers who received only the baseline and follow-up surveys, 11% and 13% reported abstinence at the 12- and 21- month follow-ups, respectively. These relatively high abstinence rates among no-treatment controls are similar to the 15% reported by Gritz et al. (1992) and the 14% reported by Lando et al. (1992). These quit rates may reflect a strong secular trend in response to continued social and normative pressure against smoking and ambient cues and encouragement for smoking cessation. This puts considerable

pressure on minimal interventions to demonstrate statistically and clinically significant effects.

We were surprised to find that our most intensive intervention had its biggest impact among precontemplators. The telephone counseling intervention essentially brought the quit rates of precontemplators up to those of contemplators. What does this mean? First, it means that precontemplative smokers should not be automatically excluded from interventions. Clearly there are smokers who may not be seriously considering quitting in the next 6 months who will be moved to take action just by making supportive interventions available. From a treatment-matching perspective, we may be able to achieve earlier treatment successes in less motivated, precontemplative smokers by providing more frequent supportive follow-up contacts after they receive self-help materials. It is also possible that the telephone counseling intervention had its greatest impact on precontemplative smokers because they are less responsive to normative trends. Our a priori assumption was that unsolicited interventions might have their biggest impact on people who were more ready to quit, but just not sufficiently motivated or aware to get access to efficacious minimal interventions. This was not the case. Perhaps some smokers use contemplation as a way of deflecting social normative pressures to quit. These smokers may be more challenging to affect with minimal interventions.

The results of our attempts to obtain cotinine verification of abstinence will likely add more fuel to the controversy over whether such verification efforts are useful (Glasgow et al., 1993; Patrick et al., 1994; Velicer, Prochaska, Rossi, & Snow, 1992). Two thirds of the abstainers provided samples either by mail or in person at the 12-month follow-up, a consistent response rate across nonvolunteer trials (cf. Gritz et al., 1992; Lando et al., 1992). The no-treatment control group had both the highest compliance rate (82%) and the highest rate of positive cotinine tests (6 of 28, or 21% of the samples). This suggests that self-reported smoking status among a population-based sample of smokers who did not receive any interventions is not as accurate as we would like. However, because of the relatively small number of abstainers in the four study groups, none of the differences in compliance and disconfirmation rates among study groups is statistically significant. Likewise, adjusting the overall abstinence rates by the disconfirmation rates does not change the study results.

The baseline predictors of 3-month abstinence in this study are similar to results from studies with volunteer smokers (Curry, 1993). Initial abstainers were younger, smoked less, had higher levels of motivation, were more likely to have quit for 6 months or longer in the past, and were less likely to have participated in a previous treatment program. Many of the same variables predicted abstinence at 21 months; however, the associations of age and previous treatment reversed directions. At 21 months, abstainers were older and were more likely to have participated in previous treatment. Abstainers at 21 months also had a greater number of previous quit attempts. We know that most smokers make several attempts before achieving permanent cessation and this pattern may be reflected in these results. Perhaps the baseline interviews or the interventions motivated younger smokers with less previous experience at quitting to try immediately, whereas the older, more experienced smokers made later, more deliberate attempts.

In conclusion, we succeeded in delivering state-of-the-art minimal interventions to a group of smokers who might not otherwise have obtained them. These nonvolunteer smokers were receptive to the intervention and made use of the materials, and with telephone counseling support, a significantly greater percentage achieved abstinence at a 3-month follow-up. Persistent improvements in smoking cessation rates with telephone counseling occurred only among smokers who were precontemplative at baseline. Perhaps higher cessation rates could be achieved among all smokers over time if telephone counseling were extended beyond 10 weeks. Overall, however, these results suggest that dissemination of interventions outside of a "teachable moment" or organizational context may not be the best investment of resources. A more optimal approach may be to explore better ways of integrating minimal interventions with existing face-to-face contacts in such settings as a health care delivery system or worksite health promotion program.

References

Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology, 45,* 1017–1028.

Bandura, A., & Schunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology, 41,* 586–598.

Britt, J., Curry, S. J., McBride, C. M., Grothaus, L., & Louie, D. (1994). Implementation and acceptance of outreach telephone counseling for smoking cessation with non-volunteer smokers. *Health Education Quarterly, 21,* 55–68.

Cohen, S., Lichtenstein, E., Prochaska, J., Rossi, J., Gritz, E., Carr, C., Orleans, C. T., Schoenbach, V., Biener, L., Abrams, D., DiClemente, C., Curry, S., Marlatt, G. A., Cummings, K. M., Emont, S., Giovino, G., & Ossip-Klein, D. (1989). Debunking myths about self-quitting: Evidence from 10 prospective studies of persons quitting smoking by themselves. *American Psychologist, 44,* 1355–1365.

Curry, S. J. (1993). Self-help interventions for smoking cessation. *Journal of Consulting and Clinical Psychology, 61,*790–803.

Curry, S. J., Gordon, J. R., & Marlatt, G. A. (1987). *Breaking Away: A guide to becoming a nonsmoker.* Seattle, WA: View Publications.

Curry, S. J., Louie, D., Grothaus, L. C., & Wagner, E. H. (1992). Written personalized feedback and confidence for smoking cessation. *Journal of Addictive Behaviors, 6,* 175–180.

Curry, S. J., Wagner, E. H., & Grothaus, L. C. (1990). Intrinsic and extrinsic motivation for smoking cessation. *Journal of Consulting and Clinical Psychology, 58,* 310–316.

Curry, S. J., Wagner, E. H., & Grothaus, L. C. (1991). Evaluation of intrinsic and extrinsic motivation interventions with a self-help smoking cessation program. *Journal of Consulting and Clinical Psychology, 59,* 318–324.

Fiore, M. C., Novotny, T. E., Pierce, J. P., Giovino, G. A., Hatziandreu, E. J., Newcomb, P. A., Surawicz, T. S., & Davis, R. M. (1990). Methods used to quit smoking in the United States. *Journal of the American Medical Association, 263,* 2760–2765.

Glasgow, R. E., Mullooly, J. P., Vogt, T. M., Stevens, V. J., Lichtenstein, E., Hollis, J. F., Lando, H. A., Severson, H. H., Pearson, K. A., & Vogt, M. R. (1993). Biochemical validation of smoking status in public health settings: Pros, cons, and data from four low-intensity intervention trials. *Addictive Behaviors, 18,* 511–527.

Gritz, E. R., Berman, B. A., Bastani, R., & Wu, M. (1992). A randomized trial of a self-help smoking cessation intervention in a nonvolun-

teer female population: Testing the limits of the public health model. *Health Psychology, 11,* 280–289.

Lando, H. A., Hellerstedt, W. L., Pirie, P. L., & McGovern, P. G. (1992). Brief supportive telephone outreach as a recruitment and intervention strategy for smoking cessation. *American Journal of Public Health, 82,* 41–46.

Orleans, C. T., & Rimer, B. R. (1992). *Enhancing adherence to cancer control regimens: Clear Horizons.* Unpublished research report.

Orleans, C. T., Schoenbach, V. J., Wagner, E. H., Quade, D., Salmon, M. A., Pearson, D. C., Fiedler, J., Porter, C. Q., & Kaplan, B. H. (1991). Self-help quit smoking interventions: Effects of self-help materials, social support instructions and telephone counseling. *Journal of Consulting and Clinical Psychology, 59,* 439–448.

Patrick, D. L., Cheadle, A., Thompson, D. C., Diehr, P., Koepsell, T., & Kinne, S. (1994). The validity of self-reported smoking: A review and meta-analysis. *American Journal of Public Health, 84,* 1086–1093.

Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 51,* 390–395.

Prochaska, J. O., DiClemente, C. C., Velicer, W. F., Rossi, J. S. (1993). Standardized, individualized, interactive and personalized self-help programs for smoking cessation. *Health Psychology, 12,* 399–405.

U.S. Department of Health and Human Services. (1990). *The health benefits of smoking cessation (DHHS Publication No. CDC 90-8416).* Washington, DC: U. S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

Velicer, W. F., Prochaska, J. O., Rossi, J. S., & Snow, M. G. (1992). Assessing outcome in smoking cessation studies. *Psychological Bulletin, 111,* 23–41.

Wagner, E. H., Schoenbach, V. J., Orleans, C. T., Grothaus, L. C., Saunders, K. W., Curry, S. J., & Pearson, D. C. (1990). Participation in a smoking cessation program: A population-based perspective. *American Journal of Preventive Medicine, 6,* 258–266.

Received August 24, 1994
Revision received January 23, 1995
Accepted March 3, 1995 ■

New Editors Appointed, 1997–2002

The Publications and Communications Board of the American Psychological Association announces the appointment of four new editors for 6-year terms beginning in 1997.

As of January 1, 1996, manuscripts should be directed as follows:

- For the *Journal of Consulting and Clinical Psychology,* submit manuscripts to Philip C. Kendall, PhD, Department of Psychology, Weiss Hall, Temple University, Philadelphia, PA 19122.
- For the *Journal of Educational Psychology,* submit manuscripts to Michael Pressley, PhD, Department of Educational Psychology and Statistics, State University of New York, Albany, NY 12222.
- For the Interpersonal Relations and Group Processes section of the *Journal of Personality and Social Psychology,* submit manuscripts to Chester A. Insko, PhD, Incoming Editor JPSP—IRGP, Department of Psychology, CB #3270, Davie Hall, University of North Carolina, Chapel Hill, NC 27599-3270.

As of March 1, 1996, manuscripts should be directed as follows:

- For *Psychological Bulletin,* submit manuscripts to Nancy Eisenberg, PhD, Department of Psychology, Arizona State University, Tempe, AZ 85287.

Manuscript submission patterns make the precise date of completion of 1996 volumes uncertain. Current editors Larry E. Beutler, PhD; Joel R. Levin, PhD; and Norman Miller, PhD, respectively, will receive and consider manuscripts until December 31, 1995. Current editor Robert J. Sternberg, PhD, will receive and consider manuscripts until February 28, 1996. Should 1996 volumes be completed before the dates noted, manuscripts will be redirected to the new editors for consideration in 1997 volumes.