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A Self-Help Intervention for African American Smokers: Tailoring Cancer Information Service Counseling for a Special Population[1]

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Background. **African Americans remain a critically underserved group for smoking cessation interventions. This study tested the effectiveness of a tailored, culturally sensitive intervention for African American smokers who called the NCI Cancer Information Service (CIS) for help to quit smoking.**

Methods. **This paper presents results of a 2-year study of tailored counseling strategies among African American smokers (n = 1,422) who called four regional CIS offices in response to a radio-based media campaign in 14 communities. Callers were randomly assigned to receive either the standard CIS quit smoking counseling and guide (*Clearing the Air*) or counseling and a guide (*Pathways to Freedom*) tailored to the quitting needs and barriers of African American smokers. Callers were predominantly female (63.6%). ages 20–49 (88%), with a high school education or more (84%). Median smoking history was 17 years; median smoking rate was 20 cigarettes/day. Standard (n = 689) and Tailored (n = 733) group subjects did not differ on most baseline measures.**

Results. **On most measures, Standard and Tailored counseling/guides received similar ratings, but the Tailored guide was rated as having more appealing photos (P = 0.001) and as being more appropriate for family members (P = 0.003). Six-month follow-up with 893 subjects (response rates were 63% Standard, 62% Tailored, ns) showed significantly more quit attempts (P = 0.002) and greater use of prequitting strategies ($P < 0.05$) among Tailored than among Standard subjects, but no differences in self-reported 1-week abstinence (14.4% Standard, 16.2% Tailored) (ns). An opportunistic 12-month follow-up of subjects recruited in the last year of the study (n = 445) (response rates were 57% Standard, 60% Tailored, ns) showed a significantly higher quit rate (15.4% Standard, 25.0% Tailored) for Tailored subjects (P = 0.034).**

Conclusions. **Results show promise for tailored approaches to boost quit attempts and success rates among African American smokers.** **©1998 American Health Foundation and Academic Press**

Key Words: **African American smokers; smoking cessation; tailored intervention.**

INTRODUCTION

African Americans remain a priority group for national tobacco control efforts. As the nation's largest minority group, African American adults have one of the highest smoking rates (25.8% vs 24.7% for U.S. adults overall), one the lowest quit rates (37.8% vs 49.6% for U.S. adults overall) [*1*], and suffer disproportionately high rates of morbidity and mortality from tobacco-caused disease [*2*]. Lower socioeconomic status and restricted health care access have served to limit African Americans' access to medical and community smoking cessation resources [*3–7*]. In addition, extensive tobacco advertising targeting the African American community has served as a barrier to tobacco control efforts [*8*].

Like the majority of U.S. smokers, most African American smokers who try to quit do so without outside help and prefer self-help and minimal contact treatments [*3,6*]. A 1990 California state survey found that African American smokers were in fact more likely than white smokers to have made a serious quit attempt in the past year, but had lower short-term success rates [*9*]. Other studies [*10,11*] with African American smokers have shown favorable results with treatments that

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combine self-help materials with brief telephone counseling [*10,11*]. These findings point to brief quit smoking interventions delivered by the National Cancer Institute (NCI)-sponsored Cancer Information Service (CIS) staff as a potentially effective population-based strategy for assisting African American smokers to acquire the motivation, skill, and support needed to quit smoking and stay quit.

Unfortunately, as past research has shown, African American smokers have tended to underutilize the CIS [*12,13*] and other telephone quit smoking helplines [e.g., *14*]. Moreover, issues of cultural appropriateness combined with evidence for a distinctive smoking pattern (low daily smoking rate, high tar/nicotine cigarettes) and unique quitting motives and barriers in the African American community have underscored the need for tailored, culturally appropriate quit smoking materials and advice [e.g., *4,5,15*]. In fact, the smoking cessation guidelines issued in 1996 by the Agency for Health Care Policy and Research recommend (p. 68) "whenever possible, smoking cessation treatments should be modified or tailored to be appropriate for the ethnic or racial populations with which they are used" [*16*].

In keeping with this general principle, the present study compared the standard CIS intervention (self-help materials and brief telephone counseling) with a tailored intervention that combined a culturally competent population-tailored self-help guide with personalized counseling, addressing the callers' quitting motives and barriers. This study took advantage of the higher volume of calls from African American smokers generated by a targeted communications campaign launched to reach African American smokers in 14 communities served by four CIS offices. That 2-year campaign, which employed 30-s radio and television paid ads and limited community outreach to motivate African American adult smokers to quit smoking and to call the CIS for help to do so, dramatically increased the number of CIS calls from African American smokers (see [*17*], this issue). The present study also builds on a similar study [*18*] that examined the impact of a tailored (versus generic) quit smoking guide among mothers of young children calling the CIS in response to a media campaign targeting mothers who smoked [*19*]. In that study, smokers were randomly assigned to receive one of three quitting guides, two "generic" guides or a guide that was tailored to women with young children. All callers received stage-based counseling that addressed quitting motives salient among others of young children. Six-month quit rates showed no benefit for callers receiving the tailored guide. However, it is possible that the tailored counseling may have "eclipsed" any benefit that tailored materials alone may have produced—a possible benefit to be harnessed by the intervention evaluated in the present study.

METHODS

Study Population

Subjects in this study were 1,422 African American adult smokers who called one of four regional offices of the CIS for free quit smoking information and materials. Participating CIS offices were located at the Duke Comprehensive Cancer Center in Durham, North Carolina; the Fox Chase Cancer Center in Philadelphia, Pennsylvania; the M. D. Anderson Cancer Center in Houston, Texas; and the University of Alabama Comprehensive Cancer Center in Birmingham, Alabama. Most (>85%) were calling in response to the *Quit Today!* targeted communications campaign initiated in 14 communities within the service areas of these four CIS offices (spanning six states in the northeastern, southeastern, and southwestern United States) during a 23-month period from August 1994 through June 1996. This campaign combined radio and television paid ads with limited community outreach to encourage African American smokers to call the CIS for free quit smoking information and materials (see [*17*]). However, anyone calling into the four participating CIS offices for smoking cessation information during the study period who met the following eligibility criteria was included in the study: African American, smoker or recent quitter (past 30 days), age 20 years or older, no previous use of the *Pathways To Freedom* [*20*] tailored smoking cessation guide, and consent to a 6-month follow-up telephone interview to assess reactions to materials and quitting outcomes. Only 3.5% of potentially eligible callers declined to give follow-up consent. African American smokers who were ineligible for the study, and smokers in all other ethnic groups, were given standard CIS quit smoking information and materials.

Baseline Measures

CIS Information Specialists collected the following baseline sociodemographic data and smoking and quitting history from all African American adult smokers: gender, age, education, and smoking status—either current smoker or recent quitter (quit within past 30 days), stage of change, number of years smoked, number of cigarettes smoked per day, 24-h quit attempts in the previous year, and whether they smoked their first cigarette within 30 min of arising, a reliable index of high nicotine dependence [*21*].

Initially, gender was not included on the baseline questionnaire (August 1994–March 1995) but was added when it was discovered that this variable was missing (April 1995). Hence, gender was recorded at baseline for only 1,102 of the 1,422 callers. However, this important variable was retrieved at 6-month follow-up for all subjects completing a follow-up interview. Among callers at baseline, most were female

(63.6%). Education levels were varied: 16% had not completed high school, 36% were high school graduates, 36% reported some college, and 12% were college graduates. Most (62%) subjects were in the 20–39 age group, while 26% were ages 40–49, and only 12% were age 50 or older.

Using standard definition of stages of change [*22*], 50% of smokers were in the contemplation stage, reporting intention to quit smoking within the next 6 months; 47% were in the preparation stage, reporting intention to quit in the next 30 days; and 2% were in the action stage, both intending to quit within 30 days and reporting having made a serious (24 h or more) quit attempt in the past 6 months. The median number of cigarettes smoked per day was 20 cigarettes with an interdecile range of 7–30 cigarettes, and the median number of years smoked was 17 years with an interdecile range of 5–30 years. The vast majority of subjects (85.7%) reported smoking their first cigarette within 30 min of awakening. Approximately three-fifths (61%) of subjects reported at least one serious (24 h or longer) quit attempt during the previous 12 months.

Research Design

Subjects were randomly assigned to one of two treatment groups based on the last digit in the primary telephone given for follow-up interviews: the standard CIS quit smoking intervention (Standard Intervention) or a tailored CIS quit smoking intervention (Tailored Intervention) that combined tailored, culturally appropriate materials, and counseling addressing population-based and personal quit smoking motives and barriers.

Experimental Conditions

Standard intervention. Subjects randomly assigned to this condition (n = 689) received the standard CIS smoking cessation counseling along with a copy of the NCI's generic quit smoking guide *Clearing the Air* [*23*]. This 24-page guide is written at the eighth grade reading level and depicts smokers and quitters from diverse racial/ethnic groups. CIS Information Specialists nationwide follow a standard stage-based counseling protocol developed through a cooperative effort of the NCI Office of Cancer Communications and the Smoking and Tobacco Control Program of the NCI's Division of Cancer Prevention and Control. In 1993, a CIS training manual was developed and training workshops were held for CIS Service Managers across the country. Information Specialists were subsequently trained by their respective Service Manager. Under this protocol, Information Specialists introduced concepts of smoking habit and addiction, advised smokers to develop a quitting plan consistent with their current stage of change, and recommended generally effective quitting and prequitting methods, emphasizing substitute nonsmoking activities and tips for overcoming common quitting barriers. Brief refresher training and a counseling checklist were provided for all Information Specialists providing counseling during the course of this study to promote adherence to this standard protocol (Table 1).

Tailored intervention. Subjects randomly assigned to this condition (n = 733) received the *Pathways to Freedom* guide [*20*] targeted to African American smokers, along with tailored "guide-based" CIS counseling to help them set up a personal quitting/maintenance plan using the guide. This 36-page guide is written at the sixth grade reading level, includes exclusively African American models, introduces quit smoking strategies geared to the modal smoking pattern of African American smokers (i.e., low daily smoking rate, menthol, high tar/nicotine cigarettes), and addresses the special obstacles that African American smokers face in their attempts to stop smoking and remain smoke-free, including a lack of information about how smoking harms health, stronger smoking norms, pervasive targeted advertising, and higher life stress [*4,5*].

Tailored counseling differed from standard CIS counseling chiefly in that the Information Specialists used an interactive style to seek a commitment to the specific stage-based quitting or maintenance strategies that are presented in the quitting guide, thereby providing special attention to motives and barriers more common among African American smokers (e.g., dealing with strong smoking norms, desires to deter one's children from becoming smokers, dealing with stress) and highlighting stage-appropriate prequitting and quitting strategies outlined in the guide. Following a modified version of the standard CIS counseling protocol, callers were encouraged to identify their personal reasons for

TABLE 1

Quit Today! Telephone Treatment Protocols

Standard	Tailored
General explanation of habit and addiction	Personalized comments on habit and addiction level
Advise to have quit plan	Probe for personal reasons to quit
General description of quit methods	Elicit choice of quitting methods
Suggest substitute activities	Elicit choice of substitute activities
Advise to get ready and set quit date	Elicit choice of get ready strategy
General tips overcoming barriers	Elicit quit ideas
Clearing the Air smoking cessation guide	Personalize barriers counseling
	Personalized quit plan
	Pathways to Freedom smoking cessation guide

quitting and assisted to develop a personalized quitting plan. Specific recommendations were reinforced by means of "Post-It" notes placed directly in the guide. Tailored counseling was designed to take no longer than standard counseling. Brief training and a counseling checklist was provided to encourage counselor adherence this tailored protocol.

Adherence and Monitoring

Quality assurance to monitor the fidelity to the respective protocols was conducted internally and externally. Internally, a monitoring system was established in which the Service Manager at each of the four participating CIS regional offices would periodically monitor the Information Specialists' adherence to the protocols and provide feedback on quality to them. The Service Manager also reviewed the CIS Call Record Form (CRF), which was used for collection of sociodemographic data, and CRF cover sheet, which was used to collect smoking and quitting history data, for completeness and accuracy. This included also checking for appropriate random assignment and ensuring that the length of time of each call was noted.

External monitoring was conducted by developing and implementing a system similar to the standard CIS call monitoring protocols [*24*]. Research staff conducted 68 anonymous test calls (34 Standard, 34 Tailored) during the 2-year intervention period to monitor counselor fidelity to the major components of the Standard and Tailored intervention protocols, appropriate random assignment, and collection of baseline measures.

Follow-up Data Collection

Follow-up assessments were conducted 6 months postbaseline by telephone interview. Interviews were administered by experienced interviewers at the Survey Research Laboratory (Chicago, IL) using a computer-assisted telephone interview (CATI) format. The primary outcome measure at 6 months was the percentage of subjects who reported tobacco abstinence for at least 1 week at the time of the interview. To be classified as abstinent, subjects had to report having not smoked at all, not even a puff, during the previous 7 days. The 6-month follow-up assessment also covered use and ratings of their self-help guide, use of prequitting strategies, number of quit attempts, smoking rate, progress through the stages of change, use of nicotine replacement, and any other smoking cessation treatment programs.

Initially, only a 6-month follow-up call was planned. However, lower than expected 6-month interview completion rates during Year 1 resulted in unexpended funds for follow-up interviews—leading us to add an abbreviated 12-month follow-up interview for 445 subjects accrued into the study during Year 2. Twelve-month interviews were administered by experienced interviewers at the Mathematica Policy Research, Inc. (Plainsboro, NJ) using an abbreviated version of the 6-month CATI interview format. The primary outcome at 12 months was the percentage of subjects who reported tobacco abstinence for at least 1 week. The 12-month interview also assessed total number of quit attempts in the preceding 12 months, stage of change for continuing smokers, and use of nicotine replacement. The 12-month interview also included a default item to elicit only 7-day smoking status, if a respondent indicated no time for additional items.

Statistical Analysis

Descriptive statistics were calculated for all baseline and follow-up measures. To compare groups, χ^2 tests were used for dichotomous and categorical variables, Cochran–Mantel–Haenszel χ^2 tests were used for ordinal variables, and the Kruskal–Wallis test was used to determine differences between groups for continuous measures, many of which were highly skewed interval and ratio data measures. A Bonferroni adjustment was made for multiple comparisons to reduce the Type I error rate. Due to the highly skewed nature of the data, nonparametric statistical analyses were performed to assess the effect of the intervention on primary outcomes. This analysis of the effect of the intervention on primary outcomes was stratified by stage of change at baseline. A stratified analysis was warranted, because the likelihood of success was expected to vary by stage of change at baseline. Stepwise multiple logistic regression was employed to assess factors associated with follow-up participation.

RESULTS

Adherence to Protocol

The Tailored Intervention calls took longer to complete than Standard Intervention calls. For the Tailored Intervention, the median length of call was 19 min with an interdecile range of 10–28 min. The median length of the Standard Intervention calls was 13 min with an interdecile range of 8–23 min. ($P < 0.05$).

Evaluation of the Service Manager call monitoring revealed overall strong adherence to the treatment protocols. Very few errors were identified and those that were identified were corrected immediately. Appropriate random assignment and complete demographic and smoking and quitting history variables as recorded on the CRF and CRF cover sheet were observed to be accurate in over 96% of the cases.

Overall, the test calls revealed very high adherence to the intervention components in each treatment protocol. A 90% or higher rate of accuracy was observed for the following components: complete smoking history

(100%), communications skills (100%), eligibility determination (98.5%), features common to both treatment protocols (98.5%), correct random assignment (95.6%), complete coverage of CIS Standard treatment components (91.2%), and correct guide receipt (90.0%). The completion of the remaining components was observed at a rate of 82% or higher: complete demographics (83.4%) and complete coverage of Tailored treatment components (82.4%).

Loss to Follow-up

Six-month follow-up interviews were completed on 63% of respondents. Although numerous reasons exist for noncompletion of 6-month follow-up interviews, approximately three-fourths (74.7%) were not completed because the respondent was unlocatable (49.0%) and/or the eligible respondent was not available to complete the interview (25.7%). Other reasons for lack of completed 6-month follow-up include no answer (7.8%), partially completed interview (7.4%), reached answering machine (5.1%), and other (2.5%). Only 2.5% refused to be interviewed when contacted.

Six-month follow-up rates did not differ by condition (63.4% Standard Intervention, 62.2% Tailored Intervention [ns]). Analysis of baseline differences between 6-month respondents and nonrespondents indicated that 6-month follow-up interviews were less likely to be completed if the subject had not tried to quit in the 12 months prior to the baseline call (OR = 0.7; 95% CI 0.6, 0.96). No significant differences in baseline predictors of 6-month follow-up were found when individuals who received either treatment were compared.

Only 445 individuals who made their initial call to the CIS during the second year of intervention were eligible for a 12-month follow-up interview. Reasons for noncompletion of 12-month follow-up include unlocatable (56.0%), respondent not available to complete interview (22.0%), reached answering machine (8.0%), no answer (5.0%), and other (7.0%). Only 2.0% refused to be interviewed.

Of these 445 eligible subjects, 261 (59.0%) completed a 12-month follow-up interview. Of the 261 individuals who completed a 12-month follow-up interview, most (78.0%) also completed a 6-month follow-up interview. Twelve-month follow up rates did not differ by condition (57.1% Standard Intervention, 60.0% Tailored Intervention [ns]). A stepwise multiple logistic regression conducted on baseline measures revealed that a 12-month follow-up interview was more likely to be completed among subjects who were older (OR = 1.5; 95% CI 1.2, 1.8) and did not smoke within 30 min of awakening (OR = 2.4; 95% CI 1.4, 4.5). The 12-month interview was less likely to be completed among subjects in more advanced stages of change at baseline (OR = 0.5; 95% CI 0.4, 0.9).

Treatment Group Comparability

There were no significant group differences in any of the baseline sociodemographic or smoking and quitting history variables within the overall sample (n = 1,422), in the sample of 6-month baseline respondents (n = 893), in the sample (n = 445) of subjects selected for 12-month follow-up intervals, or in the smaller sample of 12-month baseline respondents (n = 261).

Six-Month Follow-up Results

Use and ratings of the self-help guides. Data on the use and ratings of quit smoking materials are presented in Table 2. There were no significant between-group differences in the proportion of subjects stating that they had read the quitting guide in its entirety, that they believed that the guide presented helpful information, that it was written for people like themselves, or that the people depicted in the guide reminded them of people that they knew. Likewise, similar small percentages of subjects in each condition indicated that they found little new information in the guides or that they found it hard to identify with the quitting vignettes they featured. However, Tailored Intervention subjects using the *Pathways to Freedom* guide rated the artwork/photographs as more appealing than did Standard Intervention subjects using *Clearing the Air* (CIS Standard) ($P < 0.01$). In addition, subjects receiving *Pathways to Freedom* rated it as more suitable for other family members than did subjects receiving *Clearing the Air* ($P < 0.01$).

Six-month outcomes. Subjects were asked first to report whether they had engaged in any of the prequitting strategies. Results favored the Tailored Intervention condition for each of the strategies assessed, including cutting down on the number of cigarettes smoked ($P = 0.002$), setting a quit date ($P < 0.001$), and switching to a lower nicotine brand of cigarettes ($P < 0.001$). Subjects in the Tailored Intervention also initiated significantly more quit attempts than did the CIS Standard group ($P = 0.007$). However, no significant differences were found in any of the other 6-month outcomes, including self-reported 7-day smoking status. Among those followed at 6 months, self-reported 7-day smoking abstinence was 14.4% for the Standard Intervention and 16.2% for the Tailored Intervention. Counting those lost to follow-up as continuing smokers, the quit rate was 9.1% for the Standard Intervention and 10.1% for the Tailored Intervention. There were no significant differences between groups in use of nicotine replacement therapy (NRT). Use of nicotine patches was reported by 25.4% of the Tailored subjects and 24.9% of the Standard subjects, while 25.4 and 22.0% of Tailored and Standard subjects, respectively, reported having used nicotine gum. Also, there were no significant differences in use of other treatment programs. Among

TABLE 2

Use and Ratings of Quit Smoking Guides by Treatment Group

Item	Standard *Clearing the Air* (n = 437)	Tailored *Pathways to Freedom* (n = 456)	P value
Read all the guide	54.7%	58.2%	NS
Guide presented helpful information	36.6%	39.9%	NS
Little new information in the guide	20.1%	19.0%	NS
Identified with people in the guide	39.9%	42.2%	NS
Hard to identify with stories in guide	14.8%	19.3%	NS
Guide has appealing photographs	29.9%	43.3%	*
Guide suitable for other family members	47.0%	55.5%	*

Note. Tests: χ^2 test. NS, not significant.
*$P < 0.01$.

Tailored subjects, 5.5% reported using a one-to-one program and 4.3% of Standard subjects used this type of treatment. Use of a group program was similar in both groups, with 4.3% of Standard subjects and 3.5% of Tailored subjects indicating they attended group programming. No significant difference was observed in progress through the stages of change. However, in both treatment protocols, more individuals moved forward through the stages of change than backward (Table 3).

An exploratory analysis of the association of demographic characteristics, study-specific process variables (e.g., CIS regional office, source generating call—radio versus all other sources, called CIS before, second telephone number, length of baseline call—less than 15 min versus 15 min or more, and treatment group), smoking history, and use of prequitting behaviors with quitting and prequitting behaviors was conducted. Demographic characteristics and study-specific process variables were not associated with any of the quitting behaviors (abstinent for the previous 7 days, a quit attempt of 24 h or more, and increased stage of change). Stage of change at baseline, smoking history, and use of prequitting behaviors were associated with quitting. Preparation or action stage at baseline was associated with a greater likelihood of quitting over the previous 7 days and for quitting for at least 24 h, but with less likelihood of increasing stage. Those who had smoked longer and smoked more cigarettes per day were less likely to exhibit quitting behaviors. Cutting down on the number of cigarettes smoked per day was positively associated with quitting for at least 24 h. However, switching to cigarettes with lower nicotine content and setting a quit date were negatively associated with exhibiting quitting behaviors in the Standard Intervention group.

The exploratory analysis to examine associations of prequitting behaviors (reducing the number of cigarettes smoked per day, switching to cigarettes with lower nicotine content, and setting a quit date) revealed that in addition to the Tailored Intervention increasing the use of prequitting behaviors, subjects were more likely to reduce the number of cigarettes smoked per day if they were light smokers or in the preparation or

TABLE 3

Six-Month Outcomes by Treatment Group

	Standard (n = 437)	Tailored (n = 456)	P value
Set a quit date	45.5%	68.9%	**
Switched to lower nicotine brand of cigarettes	38.9%	67.3%	**
Median number of quit attempts/past 6 months	1.0	2.0	*
Reduced number of cigarettes smoked/day	66.4%	74.1%	*
Self-reported 7-day abstinence	14.4%	16.2%	NS
7-day abstinence (nonrespondents coded not quit)	9.1%	10.1%	NS
Stage of change			
Backward	20.7%	14.6%	NS
No change	49.5%	54.0%	
Forward	29.6%	31.4%	

Note. Tests: χ^2 test (categorical variables) and Kruskal–Wallis test for interval/ratio variables). NS, not significant.
*$P < 0.01$.
**$P < 0.001$.

action stage of change at baseline. Also, subjects were more likely to set a quit date if they had tried to quit in the 12 months previous to their baseline call to the CIS and to switch to a cigarette brand with lower nicotine if they were female or if their length of intervention call exceeded 15 min in duration.

Twelve-Month Follow-up Results

There were no significant differences among those eligible for 12-month follow-up calls ($n = 445$) in baseline sociodemographic and smoking and quitting history variables between the treatment groups with respect to age, education, stage of change, and number of cigarettes smoked per day.

At 12-months, self-reported 1-week abstinence rates were significantly higher for Tailored than for Standard Intervention subjects: 25.0% and 15.4% ($P = 0.034$), respectively. This difference remains even when nonrespondents were counted as failures (8.8% Standard Intervention; 15.0% Tailored Intervention [$P = 0.032$]). Significantly more subjects who received the Tailored Intervention moved forward in the stages of change than did those receiving the Standard Intervention after controlling for baseline stage (CMH $\chi^2 = 4.42$, $P = 0.035$). Twelve-month respondents were asked about their use of NRT during the past year. Only a small percentage of subjects in the treatment groups used NRT. Use of nicotine gum was reported by 14.5% of the Standard Intervention group and 13.2% of the Tailored Intervention group, whereas use of the nicotine patch was reported by 19.7% of the Standard group and 16.7% of the Tailored group (Table 4).

An exploratory analysis to determine the association of demographic characteristics, study-specific process variables (e.g., CIS regional office, source generating call—radio versus all other sources, called the CIS before, second telephone number, length of baseline call—less than 15 min versus 15 min or more, and treatment group), smoking and quitting history, use of prequitting behaviors, use of nicotine replacement, receptivity to materials, social support, and decisional balance with quitting behaviors and their potential moderation of the effect of the intervention was performed in a two-step process.

In exploring quitting in the Standard Intervention group, the probability of quitting over the past 7 days increased as the numbers of cigarettes smoked per day decreased from more than 20 per day to fewer than 10 per day. This relationship was not significant for subjects who received the Tailored Intervention.

In the Tailored Intervention group, subjects who were either precontemplators or contemplators at baseline and who considered friends "not at all" or "somewhat" supportive in their effort to quit smoking at the 6-month follow-up had the lowest probability of quitting over the past 7 days at 12 months. In addition, subjects who were precontemplators or contemplators at baseline and who considered friends "quite a bit" or "completely" supportive of their quit smoking effort at 6-month follow-up had a similar probability of quitting as subjects who were in preparation or action at baseline call and who considered friends "not at all" or "somewhat" supportive of their quit smoking effort at 6-month follow-up. Subjects who were in either preparation or action at baseline and who considered friends "quite a bit" or "completely" helpful of their quitting smoking at 6-month follow-up had the highest probability of quitting. This relationship was not statistically significant in the Standard Intervention group.

Examining associations with increasing stage of change revealed that in the Standard Intervention group, subjects who were precontemplators or contemplators at baseline had a higher probability of advancing to a higher stage of change at 12 months as the number of cigarettes smoked per day decreased from

TABLE 4

Twelve-Month Outcomes by Treatment Group

	Standard ($n = 117$)	Tailored ($n = 144$)	P value
Median number of quit attempts	2.0	2.0	NS
Self-reported 7-day abstinence	15.4%	25.0%	*
7-day abstinence (nonrespondents coded not quit)	8.8%	15.0%	*
Stage of change			*
Backward	15.3%	6.3%	
No change	44.1%	42.3%	
Forward	40.5%	51.4%	
Use of nicotine gum	14.5%	13.2%	NS
Use of nicotine patch	19.7%	16.7%	NS

Note. Tests: χ^2 test (categorical variables), Cochran–Mantel–Haensel χ^2 test (ordered categorical variables), Kruskal–Wallis test (interval data). NS, not significant.

*$P < 0.05$.

more than 20 cigarettes per day to fewer than 10 cigarettes per day. This was also true for subjects who were either in preparation or in action at baseline. A similar relationship was observed in the Tailored Intervention group, although it was not statistically significant.

Associations with being off cigarettes for 24 h indicated that subjects in both treatment groups were more likely to report a 24-h quit attempt at 12-month follow-up if they were in preparation or action at baseline (OR = 4.9; 95% CI 1.9, 12.5). Subjects were less likely to stay off cigarettes for 24 h at 12-month follow-up if they smoked more cigarettes per day at baseline (OR = 0.5; 95% CI 0.2, 0.8).

DISCUSSION

This study adds to the limited data of past studies of quit smoking interventions for African American smokers by showing that tailored materials and counseling were of some benefit over standard or generic approaches for African American smokers who called the CIS for quit smoking materials and information. African American smokers stimulated to call the CIS by a community-based media campaign reported slightly more favorable guide ratings, a greater number of prequitting strategies and more quit attempts 6 months after calling, and a significantly higher 12-month quit rate (15.0% versus 8.8%) when they received a guide and counseling that were designed to be culturally appropriate and to address their distinctive smoking patterns and quitting motives and barriers. Among nonquitters at 12 months, those who received a tailored intervention reported greater progress through the stages of change [*22*].

Although there are many reasons for believing that population-tailored quit smoking advice and interventions may be beneficial (e.g., more appealing or readable, more relevant quitting advice), few studies have examined smoking cessation interventions specifically tailored to African American smokers or for any other ethnic/racial or other demographic group [*16,25*]. Schoenbach et al. [*10*] and Resnicow et al. [*11*] have found generally favorable outcomes with interventions tailored for African American smokers—but these trials did not include comparisons with similar nontailored interventions. Rimer et al. [*26*] have found some evidence for the benefits of population-based tailoring in a trial comparing a tailored versus generic quit smoking guide for smokers ages 50 and over. More favorable guide ratings and improved 12-month (but not 6-month) quit rates were observed for older smokers receiving the tailored guide. Windsor et al. [*27*] found higher end-of-pregnancy quit rates among pregnant smokers who received pregnancy-tailored versus nontailored materials. On the other hand, in a study of a brief CIS-delivered quit smoking intervention for mothers of young children, Davis et al. [*18*] examined the impact of a quit smoking guide tailored to the quitting motives and concerns of young mothers—but found no differences in 6-month quit rates. However, the tailored CIS counseling that all callers in that study received may have overshadowed any potential benefits from a tailored guide.

The Tailored Intervention took a longer amount of time to deliver than the Standard Intervention. Although each protocol was designed to be the same length, the interactive nature of the Tailored treatment provided an opportunity for the caller to raise questions and obtain clarification of points made by the Information Specialists. The observed differences in the 12-month quit rate of the Tailored group compared with the Standard group potentially may make the additional minutes in the Tailored treatment a more cost-effective protocol. A cost-effectiveness analysis comparing the costs of each treatment with respect to the outcome (quit rate) should provide definitive answers.

Results of the present study tell us little about the mechanisms responsible for the observed 12-month benefit. And it is not possible to unravel the multiple possible contributors—population-tailored guide, guide-based counseling, and personalized counseling. These issues can be examined in future research. The results also point in the direction of examining computer-generated CIS-delivered materials that might be both individually and population tailored, like those developed and evaluated by Strecher et al. [*28*] for smokers seen in primary care and by Orleans et al. [*29*] for older smokers using transdermal nicotine.

This study has a number of limitations bearing on both internal and external validity. Reliance on self-report of smoking cessation limits the conclusions regarding the outcome of the study. Considerable debate continues over the necessity of biochemical verification of self-reported smoking status after cessation treatment, especially within the context of a minimal contact intervention similar to the one evaluated in this study. Biochemical validation of self-reported smoking status was not practical in this study since subjects were spread over a wide geographic region. In addition, Velicer et al. [*30*] have observed that rates of false reporting of smoking status are unlikely to exceed 5–10% in population-based intervention trials which involve minimal contact and limited interaction with smokers, such as the intervention evaluated in this study.

The 12-month outcome based on a partial cohort represents another limitation. Only those subjects who entered the study during the second year of recruitment were eligible for a 12-month follow-up interview. Nonetheless, the secondary outcomes at 6-month follow-up, including use of prequitting strategies (i.e., setting a quit date, reducing the numbers of cigarettes smoked per day, and switching to cigarettes with lower nicotine)

and significantly more quit attempts, and the significantly higher 12-month quit rate represent strong support for the Tailored Intervention as the superior treatment.

Despite high fidelity to the intervention as observed by multiple quality assurance measures, it is possible that Information Specialists gave more energetic or effective quit smoking advice to smokers in the Tailored condition. In addition, the study was conducted in the context of a targeted communications media campaign that may have sensitized smokers to the need for or value of tailored materials, potentiating any benefits of the tailored approaches evaluated here. The highly targeted content of the radio and television media advertisements and the fact that the CIS call volume from African American smokers was highly correlated with the running of the media campaign support this [*17*].

The results show promise for tailored approaches to boost quit attempts and success among African American smokers. These findings suggest the need for additional research to explore innovative methods to reach and assist African American smokers and other underserved populations to quit smoking and prevent relapse.

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REFERENCES

1. Centers for Disease Control. Cigarette smoking among adults—United States, 1995. MMWR 1997;46(51):1217–20.
2. U.S. Department of Health and Human Services. Tobacco Use Among U.S. Racial/Ethnic Minority Groups: A Report of the Surgeon General. Washington: U.S. Govt. Printing Office, 1998.
3. Fiore MC, Novotny TE, Pierce JP, Giovino GA, Hatziandrieu EJ, Newcomb P. Methods used to quit smoking in the United States: do cessation programs help? JAMA 1990;263:2760–5.
4. Lacey L, Manfredi C, Balch G, Warenecke RB, Allen K, Edwards C. Social support in smoking cessation among black women in Chicago public housing. Public Health Reps 1993;108:387–94.
5. Manfredi C, Lacey L, Warnecke R, Buis M. Smoking-related behavior, beliefs, and social environment of young black women in subsidized public housing in Chicago. Am J Public Health 1992;81:267–72.
6. Orleans CT, Schoenbach VJ, Salmon MA, Strecher VJ, Kalsbeek W, Quade D, Brooks EF, Konrad TR, Blackmon C, Watts CD. A survey of smoking and quitting patterns among Black Americans. Am J Public Health 1989;79:176–81.
7. Orleans CT, Strecher VJ, Schoenbach VJ, Salmon MA, Blackmon C. Smoking cessation initiatives for Black Americans: recommendations for research and intervention. Health Educ Res 1989; 4:13–25.
8. Robinson RG, Barry M, Bloch M, et al. Report of the Tobacco Policy Research Group on marketing and promotion targeted at African Americans, Latinos, and women. Tobacco Control (Suppl) 1992;1:524–30.
9. California Department of Health Services. Tobacco use in California, 1990. A preliminary report documenting the decline of tobacco use. La Jolla: Univ. of California at San Diego, 1991.
10. Schoenbach VJ, Orleans CT, Salmon MA, Strecher VJ, Kalsbeek WD, Quade D. A self-help quit smoking program for Black Americans. Paper presented at the annual meeting of the American Public Health Association, Boston, 1988 Nov.
11. Resnicow K, Vaughan R, Futerman R, Weston RE, Royce J, Parms C, Hearn MD, Smith M, Freeman HP, Orland, MA. A self-help smoking cessation program for inner-city African Americans: results from the Harlem Health Connection Project. Health Educ Behav 1997;24:201–17.
12. Friemuth VS, Stein JA, Kean TJ. Searching for health information: the Cancer Information Service model. Philadelphia: Univ. of Pennsylvania Press, 1989.
13. Pierce JP, Anderson DM, Meissner HI, Odenkirchen JC, Romano RM. Promoting smoking cessation in the United States: the effect of public service announcements on the Cancer Information Service telephone line. J Natl Cancer Inst 1992;84:677–83.
14. Zhu S-H, Rosbrook B, Anderson C, Gilpin E, Sadler G, Pierce JP. The demographics of help-seeking for smoking cessation in California and the role of the California Smokers Helpline. Tobacco Control 4 Suppl 1:S9–15.
15. Royce JM, Hymowitz N, Corbett K, Hartwell TD, Orland MA. Smoking cessation factors among African Americans and whites. Am J Public Health 1993;83:220–6.
16. Fiore MC, Bailey WC, Cohen SJ, et al. Smoking cessation. Clinical practice guideline No. 18. Rockville (MD): U.S. Department of Health and Human Services, Public Health Services, Agency for Health Care Policy and Research, 1996 Apr. [AHCPR Publication No. 96-0692].
17. Boyd NR, Sutton C, Orleans CT, et al. Quit Today! A targeted communications campaign to increase use of the cancer information service by African American smokers. Prev Med 1998; 27:S50–S60.
18. Davis SW, Cummings KM, Rimer BK, Sciandra R, Stone J. The impact of tailored self-help smoking cessation guides on young mothers. Health Educ Q 1992;19.
19. Cummings KM, Sciandra R, Davis S, Rimer BK. Results of an antismoking media campaign utilizing the cancer information service. Monogr Natl Cancer Inst 1993;14:113–8.
20. Robinson RG, Orleans CT, James DA, Sutton CD. Pathways to freedom. Philadelphia: Fox Chase Cancer Center, 1992.
21. Pomerleau CS, Pomerleau OF, Majchrzak MS, Kloska D, Malakuti R. Relationship between nicotine tolerance questionnaire scores and plasma cotinine. Addict Behav 1990;15:73–81.

22. Prochaska JO, DiClemente CC, Norcross JC. In search of how people change: applications to addictive behaviors. Am Psychol 1992;47:1102–14.

23. U.S. Department of Health and Human Services. Clearing the air. Bethesda (MD): U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute, Public Health Service, 1994. [NIH Publication No. 94-1647]

24. Kessler L, Fintor L, Muha C, Wun L-M, Annet D, Mazan KD. The Cancer Information Service Telephone Evaluation and Reporting System (CISTERS): a new tool for assessing quality assurance. Monogr Natl Cancer Inst 1993;14:61–5.

25. Glynn TJ, Boyd GM, Gruman JC. Essential elements of self-help minimal intervention strategies for smoking cessation. Health Educ Q 1990;17:329–45.

26. Rimer BK, Orleans CT, Fleisher L, et al. Does tailoring matter? The impact of a tailored self-help guide on ratings and short-term smoking-related outcomes for older smokers. Health Educ Res 1994;9:69–84.

27. Windsor RA, Cutter GR, Morris J, et al. The effectiveness of smoking cessation methods for smokers in public health maternity clinics: a randomized trial. Am J Public Health 1985; 75:1389–92.

28. Strecher VJ, Krueter M, Den Boer DJ, et al. The effects of computer-tailored smoking cessation messages in a family practice setting. J Fam Pract 1994;39:262–70.

29. Orleans CT, Boyd NR, Noll El, et al. Intervening through a prescription benefit plan for nicotine patch users. Paper presented at the Fourth International Congress of Behavioral Medicine. Washington, 1996 Mar 16.

30. Velicer WF, Prochaska JO, Rossi JS, et al. Assessing outcome in smoking cessation studies. Psychol Bull 1992;111:23–41.