

## Underserved Populations

# Preliminary Investigation of a Culturally Specific Smoking Cessation Intervention for Hispanic Smokers

Jeffrey S. Nevid, Rafael A. Javier

## Abstract

**Purpose.** The purpose of this study was to compare a culturally specific, multicomponent behavioral smoking cessation program for Hispanic smokers with a low-intensity, enhanced self-help control condition.

**Design.** Participants who completed pretreatment assessment were randomly assigned to treatment conditions. Smoking status was evaluated at posttreatment, 6-month follow-up, and 12-month follow-up intervals.

**Setting.** The study was based in predominantly Hispanic neighborhoods in Queens, New York.

**Participants.** Ninety-three Hispanic smokers participated: 48 men and 45 women.

**Intervention.** The multicomponent treatment involved a clinic-based group program that incorporated a culturally specific component consisting of videotaped presentations of culturally laden smoking-related vignettes. The self-help control program was enhanced by the use of an introductory group session and follow-up supportive telephone calls.

**Measures.** Smoking outcomes were based on cotinine-validated abstinence and self-reported smoking rates. Predictors of abstinence were examined, including sociodemographic variables, smoking history, nicotine dependence, acculturation, partner interactions, reasons for quitting, self-efficacy, and linguistic competence.

**Results.** Significant group differences in cotinine-validated abstinence rates in favor of the multicomponent group were obtained, but only at posttreatment. With missing data included and coded for nonabstinence, validated abstinence rates at posttreatment were 21% for the multicomponent group and 6% for the self-help group. At the 6-month follow-up, the rates were 13% for the multicomponent group and 9% for the self-help group. By the 12-month follow-up, the rates declined to 8% and 7% for the multicomponent and self-help groups, respectively. A dose-response relationship between attendance at group sessions and abstinence status was shown at posttreatment and 6-month follow-up intervals.

**Conclusions.** The results of the present study failed to show any long-term benefit from use of a clinic-based, culturally specific multicomponent smoking cessation intervention for Hispanic smokers relative to a minimal-contact, enhanced self-help control. (*Am J Health Promot* 1997;11[3]:198-207.)

**Key Words:** Smoking Cessation, Hispanics, Culture-specific, Multicomponent Treatment

## INTRODUCTION

Ethnic minority groups in our society have traditionally been under-represented in health behavior research.<sup>1</sup> In the area of smoking cessation in particular, relatively little attention has been focused on ethnic minority populations, despite the fact that traditional antismoking campaigns have generally been less effective with ethnic minorities.<sup>2</sup> Even less attention has been focused on the development of culturally sensitive smoking interventions.<sup>3</sup>

Despite reductions in the prevalence of smoking in the general population during the past 30 years, smoking rates have remained relatively unchanged among some Hispanic subgroups and may have increased among others, such as among young Puerto Rican men and women.<sup>4,5</sup> Smoking rates of men and women appear to be converging in some Hispanic-American subgroups, especially among Puerto Ricans.<sup>5</sup> Smoking prevalences among Hispanic men and women overall are currently estimated to be 28.3% and 12.7%, respectively.<sup>6</sup>

Cultural heterogeneity is recognized as a critical component that researchers need to take into account when designing and evaluating health behavior interventions.<sup>7,8</sup> Culturally informed research needs to account for heterogeneity in terms of country of origin, language, level of acculturation, and immigration status<sup>9</sup> and should be adapted to the cultural realities faced by ethnic minority groups.<sup>10</sup>

Acculturation appears to minimize

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cultural differences between Hispanic smokers and white non-Hispanic smokers in terms of attitudes, norms, and expectancies concerning smoking.<sup>11</sup> Evidence shows that Hispanic smokers who are more acculturated are more similar to non-Hispanic white smokers than are less acculturated Hispanic smokers in their perceptions of their reasons for smoking, consequences of smoking, and consequences of quitting.<sup>12</sup> Smoking rates were found to vary with acculturation status in one sample; it was higher among more acculturated women but lower among more acculturated men.<sup>11</sup>

The "vehicle" or medium that carries the message is an important factor in conveying motivational messages in a culturally appropriate manner. Use of a visual medium for conveying information and the use of narrative devices, such as enactments of culturally meaningful stories or folktales (*cuentos*), have been seen as effective means of communicating health-related messages and adaptive social values among Hispanics.<sup>13,14</sup> The present study incorporated the presentation of a series of videotaped *cuentos* within the context of a clinic-based, culturally specific, multicomponent behavioral smoking cessation intervention for Hispanic smokers (the *Sí, Puedo* or Yes, I Can program). To assess the differential treatment benefits of this intensive culturally specific program, a prospective randomized design was used to compare it with a less-intensive, minimal-contact condition consisting of a self-help program enhanced by the use of bimonthly supportive telephone calls and participation in an initial group session that focused on enhancing motivation and offering instructions for use of the self-help materials.

## METHOD

### Design

The eligible target population consisted of Hispanic smokers, at least 18 years old, who had at least minimal bilingual competence in Spanish and English and a reported history of at least one previous unsuccessful quit attempt. A multifaceted recruitment effort was undertaken to recruit research participants from the primary

target areas within central/northern Queens and more broadly from the surrounding New York City metropolitan area. Hispanics constitute 14% of the 1.9 million population of Queens, or approximately 250,000 people, with the largest concentrations in the communities immediately surrounding the treatment sites. The large majority of Hispanics in Queens represent South American (especially Colombian), Central American, Puerto Rican, and Dominican subgroups.

A continuous recruitment procedure was implemented during an 18-month period, which included repeated placements of recruitment notices in Spanish and English print and radio media, broadcast of public service announcements on a local Spanish-language television station, mailings to Hispanic and non-Hispanic physicians, outreach efforts directed at Hispanic patients in a local medical center, postings of program flyers throughout the area, and participation of local clergy with respect to distributing program materials to their congregations and permitting research staff members to set up information tables after Sunday services. Smoking cessation clinic groups were offered at different times during the week to accommodate the various work schedules of prospective participants.

In total, 526 prospective participants responded to recruitment notices. Of these, 451 (86%) met eligibility criteria, which were assessed by means of a structured telephone interview. The remaining respondents consisted of 67 nonqualifiers (13%), who were most often eliminated because of a lack of minimal conversational fluency in English. Eight callers (1.5%) were unable or unwilling to travel to treatment sites.

Eligible respondents were invited to attend group orientation/evaluation sessions that were held on a monthly basis throughout the recruitment period. Efforts were made to maximize participation at these sessions in several ways, including sending confirmation letters before scheduled meetings, placing reminder telephone calls on the day or evening before a scheduled session, scheduling makeup sessions for nonattenders, and using call-backs to nonattenders to encour-

age their participation. Despite these efforts, only 149 (33%) of the 451 qualifiers attended an orientation/evaluation. Two hundred forty-four eligible respondents (54%) repeatedly failed to attend any scheduled orientation/evaluation meetings. An additional 43 qualifiers (9.5%) could not attend because of scheduling difficulties and 15 (3%) attended but decided not to participate in the program.

### Sample

The 149 qualifiers (75 men and 74 women) who completed the orientation/evaluation phase of the study and agreed to participate in the program were assigned by pairwise random assignment to treatment conditions. A random numbers table was used to generate a sequence of odd and even numbers, which was then used as the basis for randomly assigning members of each pair of consecutively enrolled participants within each gender to either the multicomponent treatment or the enhanced self-help control condition. This procedure resulted in assignment of 74 persons to the multicomponent treatment group and 75 to the enhanced self-help control group. Fifty-six persons (35 in the multicomponent group vs 21 in the enhanced self-help control group) failed to attend the initial group session or any makeup sessions and so were coded as nonattenders and dropped from further analysis. This resulted in a final study sample of 93 attenders: 39 in the multicomponent treatment condition and 54 in the enhanced self-help condition. Comparisons between attenders and nonattenders showed no significant differences ( $p$  values  $>.05$ ) in age, income, education, smoking rates, length of smoking, or nicotine dependence.

The final study sample of 93 participants, 48 men and 45 women, averaged 43.68 years old (SD, 9.21) and reported a median family income level of \$15,000 to \$20,000 per year. More than 9 of 10 (93%) were born outside the mainland United States, with 66% of the sample originating from South or Central America and 25% from the Caribbean region. Eighty-four percent were high school graduates. Participants obtained an

average (mean) acculturation score of 27.05 (SD, 8.16) on the Short Acculturation Scale for Hispanics, which corresponds to scores associated with first-generation immigrants.<sup>15</sup>

Participants smoked an average of 21.10 (SD, 10.65) cigarettes daily, or slightly more than one pack a day. Men and women did not differ significantly in smoking rates. Participants had smoked for nearly 25 years on the average (mean, 24.99 years; SD, 9.39) and had started smoking at a median age of 16.0 years.

### Measures

All measures were administered in English with Spanish translation available. Backward translation methods were used to create comparable versions of questionnaire measures in the two languages. The outcome variables consisted of smoking status (abstinence vs continued smoking) and smoking rate. An additional set of measures was used to examine potential predictors of smoking status, including sociodemographic variables, acculturation status, linguistic competence, partner interactions, length of smoking, smoking rate, nicotine dependence, perceived self-efficacy for resisting smoking temptations, perceived likelihood of quitting smoking, and reasons for quitting.

**Sociodemographic variables.** A background questionnaire was used to gather sociodemographic information, including age, income, education, country of origin, number of years living in the United States, and number of children living at home.

**Smoking behavior.** Smoking rate was assessed by means of a self-report of the number of cigarettes smoked during the preceding 24-hour period. A criterion of no reported smoking for the preceding week ("not even a puff") was used as the measure of self-reported abstinence. **Saliva cotinine analysis was used to validate self-reported abstinence, with use of a cutoff of <20 ng/ml.**<sup>16</sup>

**Nicotine dependence.** The Fagerström Tolerance Questionnaire,<sup>17</sup> a widely used eight-item questionnaire, was

used to measure nicotine dependence. Composite scores can range from 1 to 11, and a median value of 6 or 7 has been used as a cutting score separating high from low nicotine-dependent groups.<sup>17</sup> Reliability has ranged from .51 to .54.<sup>18</sup>

**Confidence questionnaire.** The Confidence Questionnaire<sup>19</sup> is a measure of perceived self-efficacy for resisting smoking in various situations. Respondents are instructed to estimate the probability, ranging from 0% to 100% in increments of 10, that they would be able to resist smoking in each of 46 situations they might encounter. An overall score was computed on the basis of the mean response across all 46 items. The Confidence Questionnaire has been found to be an important predictor of maintaining abstinence and avoiding relapse after smoking cessation interventions.<sup>19,20</sup> A reliability coefficient of .99 has been reported.<sup>21</sup>

**Desire to quit, likelihood of stopping smoking, and expected difficulty quitting.** five-point scale was used for participants to rate the strength of their desire to quit smoking, the likelihood that they would be able to stop smoking by the end of the program, and the expected difficulty they would have quitting.

**Reasons for quitting.** A five-point scale, adapted from an attributional questionnaire,<sup>22</sup> was used to assess the perceived importance of different reasons for quitting smoking, including physician advice, self-challenge, advice from a member of the clergy, health reasons, family pressure, responsibility to self, responsibility to family, costs of smoking, smoking-related illness, and discomfort from smoking.

**Partner interaction questionnaire (PIQ-20).** The PIQ-20\* measures perceptions of partner support in various smoking-related situations. Respondents rated how often their partners performed specific positive

and negative behaviors in response to their smoking with use of a four-point scale ranging from 0 ("never occurred") to 3 ("occurred often"). Reliabilities have ranged from .79 to .90 for the negative subscale, from .91 to .94 for the positive subscale, and from .86 to .89 for the total scale.\* The instrument was administered only to participants who reported having live-in partners (n = 28). The ratio of the positive to negative interactions has been shown to be a better predictor of quitting than the sums of either positive or negative interactions.<sup>23</sup>

### Short acculturation scale for Hispanics.

The Short Acculturation Scale for Hispanics<sup>15</sup> is a 12-item scale that is administered in English or Spanish versions and measures such aspects of acculturation as language spoken, language preferences, and friendship patterns with Hispanics and Anglos. Respondents rated the items on a five-point scale. An alpha coefficient of .92 was reported, which compares favorably with findings with other acculturation scales.<sup>15</sup>

**Language proficiency.** Language proficiency was measured by Spanish and English versions of the vocabulary subscale of the Wechsler Adult Intelligence Scale and by a word-naming task. The word-naming task required participants to name as many words as they could within a 1-minute period in Spanish and English. Comparison between the number of words produced in the respective languages was taken as a measure of relative linguistic proficiency.<sup>24,25</sup>

### Treatment credibility questionnaire.

A treatment credibility questionnaire<sup>26</sup> consisting of three separate items was administered after the initial group session in both treatment conditions to assess respondents' perceptions of the following: (1) logic of the treatment procedure, (2) expectancies of treatment success, and (3) willingness to recommend the treatment to a friend.

### Specimen Collection

Saliva samples were obtained from participants who reported smoking abstinence at posttreatment and 6-

Kamarck TW, Lichtenstein E. The PIQ-20: a 20-item version of the partner interaction questionnaire measuring support for smoking cessation. Unpublished manuscript, 1984.

month and 12-month follow-up intervals. Saliva was expurgated into plastic vials that were then sealed and kept frozen until they were delivered to an independent testing laboratory, the American Health Foundation of Valhalla, New York, for analysis of saliva cotinine levels.

### Intervention

Participants were randomized to one of two treatment conditions: (1) culturally specific multicomponent behavioral intervention or (2) enhanced self-help control.

**Culturally specific multicomponent behavioral intervention.** The culturally specific multicomponent behavioral intervention was implemented in weekly group sessions that lasted approximately 2 hours each. Group leaders were bilingual Hispanic mental health professionals (psychologists and social workers) who followed a structured behavioral treatment manual developed by the principal investigators (J. S. N. and R. A. J.). Group leaders were trained by the principal investigators in the use of the treatment manual in two 8-hour-long training sessions that involved didactic presentations and role-playing exercises. Preliminary discussions with treatment group leaders indicated that participants might feel freer in openly discussing their feelings and experiences if groups were restricted to members of their own gender. Consequently, groups were composed of members of the same gender and group leaders were assigned to groups comprised of members of their own gender. In total, six multicomponent treatment groups were held, three men-only groups and three women-only groups. An effort was made to schedule groups at times that accommodated the scheduling preferences of prospective participants, within the constraints imposed by the availability of group leaders. The numbers of participants across groups ranged from 3 to 12.

Multicomponent behavioral treatment followed a staging model in which exposure to motivation enhancement exercises and quitting techniques in early sessions was followed by relapse prevention training in later sessions. Specific

treatment components included commitment enhancement exercises (for example, written and oral declarations of intent to quit, pronouncement of intent to quit before family members), stimulus control, self-reward, and coping response training for handling smoking urges and temptations. A nicotine fading procedure based on a computerized brand switching protocol was used to assign weekly reductions of 30%, 60%, and 90% of initial brand nicotine levels in preparation for a targeted group quit date corresponding to the day preceding the fifth group treatment session. Relapse prevention training based on the Marlatt and Gordon model<sup>27,28</sup> incorporated exercises involving identification and avoidance of high-risk smoking situations, use of coping responses for handling smoking temptations, and cognitive restructuring for coping with lapses and avoiding abstinence violation effects.

A culturally specific treatment component, *cuento* (story) therapy, was also used as part of the multicomponent program. This involved the presentation of a series of videotaped vignettes (*cuentos*) featuring Hispanic actors who dramatized culturally laden scenes depicting smoking-related situations, some of which featured adaptations of traditional Hispanic folktales. Culturally laden values such as *machismo* (masculinity), *familiarismo* (responsibility to family), and *respeto* (respect for self and others) were incorporated in these vignettes to convey antismoking messages and encourage smoking cessation efforts. After the groups viewed each vignette, a group discussion was held relating the themes depicted in the dramatization to the challenges faced by program participants in quitting smoking. *Cuentos* were staged in an order corresponding to the goals of the behavioral program, with initial stories conveying themes relating to building motivation, increasing commitment to quitting smoking, enhancing self-efficacy, and debunking culturally laden beliefs underlying smoking (such as associations between male smoking and machismo). *Cuentos* presented in later sessions involved scenes depicting the use of coping responses for handling smoking urges

and prevention of abstinence violation effects. *Cuento* scripts received high ratings from an independent panel of three bilingual Hispanic professionals on measures of cultural appropriateness of characters, cultural sensitivity of scripts, and English and Spanish clarity and comprehensibility (all means >3.0 on a 4-point scale).

A buddy support system was implemented that encouraged participants to telephone their assigned buddies at least once weekly to exchange quitting suggestions, offer mutual support, and provide further opportunity to discuss the themes represented in the *cuento* presentation in the preceding session. Homework forms were used as a compliance check, but were not returned consistently. Follow-up analysis showed that the number of homework forms returned was unrelated to abstinence at any assessment interval ( $p$  values >.05).

**Enhanced self-help control condition.** The self-help control condition involved distribution of the widely used American Lung Association smoking cessation manual, *Freedom from Smoking in 20 Days*,<sup>29</sup> which was presented in both the original English version and a backward-translated Spanish version. This was supplemented by the distribution of a Spanish-language self-help booklet, *Guía para Dejar de Fumar*,<sup>30</sup> which features colorful photographs of Hispanic smokers offering smoking cessation suggestions. These self-help components were enhanced by an introductory group session that focused on building motivation and clarifying instructions for the proper use of the self-help manuals and by the use of supportive telephone calls on a twice-monthly basis during the following 8-week period.

### Maintenance Programming

The same low-intensity maintenance program was used in both treatment conditions and consisted of (1) distribution of a Spanish/English version of the American Lung Association self-help maintenance manual *A Lifetime of Freedom from Smoking*<sup>31</sup> and (2) use of supportive telephone calls on a twice-monthly basis during the first 6-month follow-up interval.

## Analysis

The analysis was conducted in three phases. The first phase consisted of a preliminary analysis of (1) pretreatment differences between treatment conditions with respect to participants' smoking rates and sociodemographic characteristics, (2) linguistic sensitivity of multicomponent treatment group sessions, and (3) differences between treatment conditions with respect to perceived credibility and expectancy of improvement. The second phase consisted of an analysis of differences in smoking outcomes (abstinence and smoking rate) between participants in the respective treatment conditions. Both self-reported abstinence and saliva cotinine-validated abstinence data are reported. Moreover, to provide a more conservative basis for analyzing group differences, abstinence data were analyzed with both (1) missing cases (dropouts) excluded and (2) missing cases included and coded as nonabstinent. The third phase of the analysis focused on examining predictors of smoking abstinence at posttreatment and follow-up assessment panels on the basis of pretreatment measures.

Results were analyzed by the appropriate parametric and nonparametric tests of significance depending on the metric involved and the normality of the distribution. The Mann-Whitney *U* test was used for analyzing variables that were measured on an ordinal scale and when the data were found not to be normally distributed.

## RESULTS

### Preliminary Analysis

The analysis of pretreatment differences showed no significant differences between treatment conditions in smoking rates or sociodemographic characteristics (Table 1). Measures of treatment credibility showed one significant group difference ( $t [87] = 3.14, p < .002$ ), with multicomponent participants expressing greater confidence about their likelihood of quitting smoking as a result of the program (mean, 3.75; SD, 0.91) than enhanced self-help participants (mean, 3.09; SD, 1.01).

A linguistic rating panel consisting of two bilingual Hispanic psychologists with extensive clinical experience with Hispanic clients rated a randomly selected subset of audio-taped segments of multicomponent group sessions. Raters used a four-point scale to rate each group leader's use of language on the following criteria: (1) verbal fluency/accuracy, (2) linguistic sensitivity, and (3) cultural sensitivity. An examination of the mean ratings across group leaders showed high ratings for each of the linguistic sensitivity measures (verbal fluency/accuracy: mean, 3.72, SD, 0.50; linguistic sensitivity: mean, 3.83, SD, 0.38; cultural sensitivity: mean, 3.85, SD, 0.36). Interrater agreement equaled or exceeded 95% across items.

### Attrition

Participants who terminated participation during the treatment phase of the program were classified as dropouts. Dropout rates were not significantly different across treatment conditions (18% in the multicomponent program vs 20% in the enhanced self-help control program). Reasons for attrition were also comparable across groups, with moving out of the area (33%) and withdrawal of interest in continuing with the program (39%) representing the most frequently given reasons.

### Analysis of Smoking Status

With missing data included and coded for nonabstinence (treatment failure), the percentages of self-reported abstainers in the multicomponent condition were 36% at posttreatment, 18% at 6-month follow-up, and 15% at 12-month follow-up (Table 2). Self-reported abstinence rates for the enhanced self-help condition were 13% at each of the three assessment intervals. Chi-square analysis showed significant differences in self-reported abstinence favoring the multicomponent group condition, but only at posttreatment ( $\chi^2 [1] = 6.81, p < .01$ ).

Self-reported abstainers who failed to provide saliva samples were coded as nonabstinent. Among self-reported abstainers who provided saliva samples, cotinine analysis showed a relatively

high invalidation rate of 31% (5 of 16 samples) at posttreatment, 23% (3 of 13 samples) at 6-month follow-up, and 22% (2 of 9 samples) at 12-month follow-up. Rates of invalidation did not vary significantly between treatment conditions at any assessment interval ( $p$  values  $>.05$ ).

An analysis by Fisher's exact test was conducted to determine whether the high rates of cotinine invalidation could be accounted for by exposure to secondhand smoke, as indicated by the presence of other smokers in the home. No significant relationships ( $p$  values  $>.05$ ) were found at posttreatment, 6-month follow-up, or 12-month follow-up intervals between the presence of other smokers in the home and cotinine invalidation.

Analysis of group differences in validated abstinence rates, as done by Fisher's exact test on the basis of both inclusion and exclusion of missing data, showed significant differences favoring the multicomponent group at posttreatment ( $p$  values  $<.05$ ) (Table 2). Including dropouts coded as treatment failures, 21% of multicomponent group participants, as compared with 6% of self-help control group participants, demonstrated validated abstinence by posttreatment assessment.

Analysis of group differences in validated abstinence rates at 6- and 12-month follow-up intervals showed nonsignificant group differences at each interval. With missing data coded for nonabstinence, the percentages of validated abstainers in the multicomponent group treatment program declined to 13% at 6-month follow-up and to 8% at 12-month follow-up. Percentages of validated abstainers in the enhanced self-help condition increased slightly from 6% at posttreatment to 9% at 6-month follow-up, before declining to 7% at 12-month follow-up.

Only two participants (2%), one in each treatment condition, demonstrated cotinine-validated abstinence at both posttreatment and 12-month follow-up intervals. Among initial (posttreatment) quitters, rates of relapse at the 12-month follow-up ranged from 50% in the enhanced self-help condition to 78% in the multicomponent treatment condition.

Table 1

## Tests of Pretreatment Equivalence Between Multicomponent Behavioral Group and Enhanced Self-Help Control Conditions

Variable	Multicomponent Behavioral Group					Enhanced Self-help Control Group					p Value
	n	%	Md	M	SD	n	%	Md	M	SD	
Sociodemographic variables											
Gender											.371 <sup>*</sup>
Male	18	46.2				30	55.6				
Female	21	53.8				24	44.4				
No. of years in U.S.	37		20.0			54		14.0			.148 <sup>†</sup>
Region of origin											.731 <sup>*</sup>
South/Central America	24	70.6				37	74.0				
Caribbean	10	27.4				13	26.0				
Age in years	36			43.39	8.88	40			43.95	9.61	.793 <sup>‡</sup>
Income	37		3.00			53		3.00			.851 <sup>†</sup>
Education	36		6.00			40		3.00			.559 <sup>†</sup>
Socioeconomic status (Rossi-Siegel index)	26			33.69	12.92	23			36.17	17.85	.577 <sup>‡</sup>
Children living in home											.105 <sup>*</sup>
Yes	21	58.3				15	39.5				
No	15	41.7				23	60.5				
Acculturation scale total	38			28.11	9.25	52			26.27	7.26	.294 <sup>‡</sup>
Smoking variables											
Age started smoking	39		16.00			54		16.00			.495 <sup>†</sup>
Years smoking	38			25.47	9.62	54			24.66	9.30	.684 <sup>‡</sup>
Mean cigarettes smoked per day	39			22.93	12.24	54			19.78	9.24	.162 <sup>‡</sup>
Fagerström nicotine dependence	35			5.69	2.11	37			5.70	2.15	.973 <sup>‡</sup>
Fagerström group											.739 <sup>*</sup>
Low	24	68.6				24	64.9				
High	11	31.4				13	35.1				
Expectancy and confidence variables											
Strength of desire to quit	37			3.95	1.05	53			3.87	1.06	.731 <sup>‡</sup>
Expected difficulty quitting	38		4.00			53		4.00			.206 <sup>†</sup>
Likelihood of stopping smoking	38			3.68	0.90	50			3.54	1.07	.506 <sup>‡</sup>
Self-efficacy for resisting smoking	37			4.15	1.69	53			4.23	1.91	.841 <sup>‡</sup>
Reasons for quitting											
Physician advice	33			2.82	1.65	46			3.13	1.61	.403 <sup>‡</sup>
Self-challenge	35			3.54	1.50	47			3.57	1.21	.916 <sup>‡</sup>
Advice from clergyperson	33		1.00			43		1.00			.929 <sup>†</sup>
Health reasons	38		5.00			49		5.00			.513 <sup>†</sup>
Family pressure	33		4.00			44		4.00			.335 <sup>†</sup>
Responsibility to self	34		5.00			46		5.00			.897 <sup>†</sup>
Responsibility to family	37		5.00			48		5.00			.448 <sup>†</sup>
Cost of smoking	35			2.91	1.58	47			3.00	1.55	.806 <sup>‡</sup>
Smoking-related illness	35		4.00			49		5.00			.039 <sup>†</sup>
Discomfort from smoking	37		4.00			46		4.00			.461 <sup>†</sup>
Linguistic variables											
English Wechsler vocabulary scaled score	35			6.91	3.07	44			6.23	3.63	.375 <sup>‡</sup>
Spanish Wechsler vocabulary scaled score	36			13.58	3.28	45			13.38	2.49	.749 <sup>‡</sup>
English word count	38			24.11	6.90	51			23.31	5.14	.537 <sup>‡</sup>
Spanish word count	39			23.05	5.98	51			21.08	3.79	.077 <sup>‡</sup>
Treatment credibility variables											
How logical is program	36			4.25	0.65	53			3.91	0.79	.033 <sup>‡</sup>
Confidence in quitting as a result of program	36			3.75	0.91	53			3.09	1.01	.002 <sup>‡</sup>
Willingness to recommend program to friend	35			4.11	0.87	52			3.65	0.99	.028 <sup>‡</sup>

Md, Median; M, mean; SD, standard deviation.

<sup>\*</sup> Difference tested by  $\chi^2$  analysis.<sup>†</sup> Difference tested by Mann-Whitney *U* test.<sup>‡</sup> Difference tested by *t* test.<sup>§</sup> Item drawn from behavioral risk factor questionnaire: 1, >\$10,000; 2, \$10,000 to \$15,000; 3, \$15,000 to \$20,000; 4, \$20,000 to \$25,000; 5, \$25,000 to \$35,000; 6, \$35,000 to \$50,000; 7, >\$50,000.

Item drawn from behavioral risk factor questionnaire: 1, eighth grade or less; 2, some high school; 3, high school graduate or GED certificate; 4, some technical school; 5, technical school graduate; 6, some college; 7, college graduate; 8, postgraduate or professional degree.



## Reductions in Baseline Smoking

Smoking rates among nonabstinent participants who were available for posttreatment assessment ( $n = 52$ ) showed a significant decline ( $p < .001$ ) from a mean of 22.00 (SD, 11.48) cigarettes per day at baseline to a mean of 14.55 (SD, 9.47) cigarettes per day by posttreatment, a reduction of 34%. By 6-month follow-up, smoking rates for nonabstinent participants ( $n = 36$ ) averaged 11.01 cigarettes per day (SD, 6.64), a significant reduction from the baseline rate of 45% ( $p < .001$ ). Similarly, by the 12-month follow-up, smoking rates for nonabstinent participants ( $n = 37$ ) averaged 11.28 cigarettes per day (SD, 7.38), a significant reduction from the baseline rate of 42% ( $p < .001$ ). No significant differences between treatment conditions in percentage reduction of baseline smoking were obtained at any assessment interval.

## Predictors of Smoking Cessation

Predictors of smoking cessation were analyzed by comparing abstainers and nonabstainers across treatment groups at each assessment panel (posttreatment, 6-month and 12-month follow-ups) (Table 3). Predictor variables were clustered by categories (sociodemographic characteristics, smoking variables, expectancy and confidence variables, reasons for quitting, partner interactions, and linguistic variables) and a modified Bonferroni procedure was used to set a designated alpha rate within clusters of  $p < .01$ .

Abstainers reported significantly fewer negative partner interactions at the 12-month follow-up interval than did nonabstainers ( $p = .001$ ). Abstainer/nonabstainer differences in negative partner interactions at posttreatment and 6-month follow-up intervals were nonsignificant but were distributed in the same direction and may have been attenuated by the limited number of validated abstainers. Presence of children in the household approached the designated significance level ( $p = .035$ ) at posttreatment, suggesting that abstainers were more likely to have children living at home.

Within the linguistic cluster, significantly greater pretreatment Spanish word counts were found for abstainers at posttreatment ( $p = .01$ ). The meaning of this difference is attenuated by nonsignificant differences between abstainers and nonabstainers at any assessment interval on pretreatment Spanish Wechsler vocabulary scale scores.

Among smoking-related variables, only strength of desire to quit approached designated significance levels and only at posttreatment ( $p = .014$ ). Posttreatment abstainers had reported at pretreatment a stronger desire to quit than had nonabstainers. Neither reasons for quitting, nor perceived likelihood of stopping smoking, nor self-efficacy for resisting smoking temptations predicted smoking outcomes at any assessment interval.

## Attendance and Smoking Outcomes

Overall attendance in the multi-component group program was spotty, with participants attending an average of 4.56 (SD, 2.27) sessions out of the eight scheduled sessions. With missing cases coded as nonabstinent, validated abstainers at posttreatment ( $n = 8$ ) were found to have attended a greater number of treatment sessions (mean, 6.00; SD, 2.45) than nonabstainers ( $n = 32$ ; mean, 4.09; SD, 2.15) ( $p < .05$ ). Similarly, at 6-month follow-up, abstainers ( $n = 5$ ) were found to have attended significantly more treatment sessions (mean, 7.20; SD, 1.30) than nonabstainers ( $n = 35$ ; mean, 4.09; SD, 2.16) ( $p < .005$ ). Because it is conceivable that more frequent attendance by abstainers may have been a function of an initially greater desire to quit, a further analysis was conducted and showed that number of sessions attended was unrelated to initial desire to quit ( $r = .09$ ,  $p = .615$ ). The small number of validated abstainers at the 12-month follow-up ( $n = 3$ ) precluded further analysis of abstainer/nonabstainer differences in attendance.

## Power Analysis of Exploration of Predictor Variables

Retrospective power analyses were conducted on all nonsignificant comparisons between abstainers and nonabstainers. Power was generally low for all of these comparisons, ranging from .01 to .44, and may have contributed to failure to identify additional predictors of abstinence.

**Table 2**  
Point-Prevalence Abstinence Rates by Treatment Condition

Group	Posttreatment		6-Month Follow-up		12-Month Follow-up	
	Self-report	Saliva Cotinine Validation*	Self-report	Saliva Cotinine Validation	Self-report	Saliva Cotinine Validation
Excluding missing cases						
Culturally specific multicomponent behavioral program	45% (14/31) <sup>†</sup>	26% (8/31) <sup>‡</sup>	30% (7/23)	22% (5/23)	27% (6/22)	14% (3/21)
Enhanced self-help control	16% (7/44)	7% (3/44)	23% (7/31)	16% (5/32)	23% (7/30)	13% (4/31)
Including missing cases						
Culturally specific multicomponent behavioral program	36% (14/39)	21% (8/39) <sup>‡</sup>	18% (7/39)	13% (5/39)	15% (6/39)	8% (3/39)
Enhanced self-help Control	13% (7/54)	6% (3/54)	13% (7/54)	9% (5/54)	13% (7/54)	7% (4/54)

\*Saliva cotinine validated ( $< 20$  ng/ml).

<sup>†</sup>Numerators and denominators represent numbers of abstainers and numbers of participants, respectively.

<sup>‡</sup>Culturally specific multicomponent versus enhanced self-help control,  $p < .05$ .

## DISCUSSION

The present study showed significantly higher initial quit rates among participants in a culturally specific, multicomponent behavioral group program than among participants in an enhanced self-help control condi-

tion. Group differences were not maintained by 6-month and 12-month follow-up intervals, however. By the 12-month follow-up, percentages of validated abstainers were virtually identical in the two groups (8% vs 7%, respectively). These 12-month abstinence rates fall within the low range of

the self-quitting programs reviewed by Cohen et al.<sup>32</sup>

Our findings suggest that participation in a culturally sensitive group program that provides support and training in cessation techniques may aid initial cessation, but may be insufficient to avert relapse or

**Table 3**  
**Effect Sizes and Significance Levels for Comparisons Between Abstainers and Nonabstainers at Posttreatment, 6-Month Follow-Up, and 12-Month Follow-Up**

Variable	Posttreatment Effect		6-Month Effect		12-Month Effect	
	Size ( <i>d</i> )	<i>p</i> Value	Size ( <i>d</i> )	<i>p</i> Value	Size ( <i>d</i> )	<i>p</i> Value
Sociodemographic variables						
Gender	.06	.781 <sup>†</sup>	.12	.733 <sup>†</sup>	.22	.420 <sup>†</sup>
Number of years in U.S.	.26	.263 <sup>‡</sup>	.27	.340 <sup>§</sup>	.42	.151 <sup>§</sup>
Region of origin	.00	1.00 <sup>†</sup>	.00	1.00 <sup>†</sup>	.14	.637 <sup>†</sup>
Age in years	.17	.493 <sup>§</sup>	.35	.233 <sup>§</sup>	.05	.860 <sup>§</sup>
Income	.17	.469 <sup>‡</sup>	.11	.705 <sup>‡</sup>	.03	.921 <sup>‡</sup>
Education	.00	.993 <sup>‡</sup>	.12	.665 <sup>‡</sup>	.50	.086 <sup>‡</sup>
Socioeconomic status (Rossi-Siegel index)	.16	.619 <sup>§</sup>	.16	.677 <sup>§</sup>	.12	.757 <sup>§</sup>
Children living in home	.53	.035 <sup>†</sup>	.00	1.00 <sup>†</sup>	.23	.428 <sup>†</sup>
Acculturation scale total	.28	.253 <sup>§</sup>	.17	.543 <sup>§</sup>	.10	.718 <sup>§</sup>
Smoking variables						
Age started smoking	.12	.602 <sup>‡</sup>	.35	.190 <sup>‡</sup>	.13	.636 <sup>‡</sup>
Years smoking	.20	.400 <sup>§</sup>	.04	.878 <sup>§</sup>	.05	.864 <sup>§</sup>
Mean cigarettes smoked per day	.16	.480 <sup>‡</sup>	.37	.187 <sup>§</sup>	.16	.572 <sup>‡</sup>
Fagerström nicotine dependence	.19	.481 <sup>§</sup>	.02	.937 <sup>§</sup>	.24	.432 <sup>§</sup>
Fagerström group (low/high)	.18	.478 <sup>†</sup>	.12	.676 <sup>†</sup>	.27	.362 <sup>†</sup>
Expectancy and confidence variables						
Strength of desire to quit	.61	.014 <sup>§</sup>	.44	.116 <sup>§</sup>	.07	.811 <sup>§</sup>
Expected difficulty quitting	.12	.611 <sup>‡</sup>	.21	.439 <sup>‡</sup>	.00	.989 <sup>‡</sup>
Likelihood of stopping smoking	.24	.327 <sup>§</sup>	.45	.062 <sup>§</sup>	.34	.243 <sup>§</sup>
Self-efficacy for resisting smoking	.18	.447 <sup>§</sup>	.35	.209 <sup>§</sup>	.09	.761 <sup>§</sup>
Reasons for quitting						
Physician advice	.43	.092 <sup>‡</sup>	.21	.480 <sup>§</sup>	.18	.578 <sup>§</sup>
Self-challenge	.09	.738 <sup>§</sup>	.22	.468 <sup>§</sup>	.03	.923 <sup>§</sup>
Advice from clergyperson	.32	.218 <sup>‡</sup>	.40	.183 <sup>‡</sup>	.30	.336 <sup>‡</sup>
Health reasons	.22	.368 <sup>‡</sup>	.15	.586 <sup>‡</sup>	.16	.591 <sup>‡</sup>
Family pressure	.19	.464 <sup>‡</sup>	.24	.421 <sup>‡</sup>	.08	.790 <sup>‡</sup>
Responsibility to self	.21	.392 <sup>‡</sup>	.10	.741 <sup>‡</sup>	.04	.898 <sup>‡</sup>
Responsibility to family	.54	.027 <sup>‡</sup>	.36	.207 <sup>‡</sup>	.02	.946 <sup>‡</sup>
Cost of smoking	.08	.748 <sup>§</sup>	.18	.545 <sup>§</sup>	.03	.935 <sup>§</sup>
Smoking-related illness	.09	.717 <sup>‡</sup>	.24	.403 <sup>‡</sup>	.05	.869 <sup>‡</sup>
Discomfort from smoking	.00	.992 <sup>‡</sup>	.09	.762 <sup>§</sup>	.17	.578 <sup>§</sup>
Partner interaction variables						
Negative partner interaction subscale score	.53	.185 <sup>§</sup>	.75	.135 <sup>‡</sup>	.85	.001 <sup>§</sup>
Positive partner interaction subscale score	.02	.955 <sup>§</sup>	.29	.746 <sup>§</sup>	.13	.765 <sup>§</sup>
Partner interaction ratio	.63	.094 <sup>‡</sup>	.82	.100 <sup>‡</sup>	.47	.268 <sup>‡</sup>
Linguistic variables						
English Wechsler vocabulary scaled score	.03	.902 <sup>§</sup>	.27	.374 <sup>§</sup>	.08	.793 <sup>§</sup>
Spanish Wechsler vocabulary scaled score	.22	.372 <sup>‡</sup>	.21	.484 <sup>‡</sup>	.33	.297 <sup>‡</sup>
English word count	.43	.071 <sup>§</sup>	.63	.027 <sup>‡</sup>	.59	.046 <sup>§</sup>
Spanish word count	.63	.010 <sup>§</sup>	.66	.022 <sup>§</sup>	.33	.259 <sup>§</sup>

Note: Missing cases were included in the analysis and coded for nonabstinence.

<sup>†</sup>Differences tested by  $\chi^2$  analysis.

<sup>‡</sup>Differences tested by Fisher's exact test.

<sup>‡</sup>Differences tested by Mann-Whitney *U* test.

<sup>§</sup>Differences tested by *t* test.



promote long-term smoking cessation. Perhaps more intensive efforts or new techniques are needed to maintain abstinence after the active treatment phase. Relapse rates of 50% in the minimal contact condition and 78% in the multicomponent group program suggest that a low-intensity maintenance program may not be potent enough to prevent eventual relapse in this population. Likewise it does not appear that relapse prevention techniques during the intervention phase are sufficient to bolster resistance to eventual relapse.

The present findings are in line with those of previous research that showed no increased long-term benefit from more intensive, clinic-based smoking interventions than from self-help conditions enhanced by the use of brief counseling or personalized feedback.<sup>33-35</sup> Perhaps it is less surprising that a more-intensive multicomponent program failed to demonstrate superior results to those of a minimal-contact, self-help control condition at follow-up intervals than it is that it produced initially higher cessation rates despite poor attendance. Moreover, the minimal contact condition, like the intensive treatment condition, incorporated culturally specific features, such as the use of a Hispanic-oriented self-help quitting guide.

The present study did find evidence of a dose-response relationship with respect to attendance in the intensive, multicomponent program. More frequent attenders were more likely to demonstrate initial cessation and 6-month follow-up abstinence than were less frequent attenders. Moreover, attendance was unrelated to initial desire to quit. This suggests that more intensive treatments may yet yield greater benefits in smoking outcomes if they are structured in a way that maximizes exposure.

Relatively high rates of cotinine invalidation of self-reported abstinence were obtained (range, 22% to 31% invalidated samples across assessment intervals). Recent studies of smoking cessation with predominantly non-Hispanic white samples reported cotinine invalidation rates of 6% to 19%.<sup>36,37</sup> By contrast,

investigators have reported rates of cotinine invalidation among certain age and gender subgroups in a predominantly Hispanic sample that ranged as high as 26%.<sup>16</sup> Similarly, McAlister et al.<sup>33</sup> observed high rates of invalidation (range, 41% to 65%) with use of another biochemical marker (carbon monoxide) in a predominantly Hispanic sample. The accumulating evidence from studies of Hispanic smokers indicates that the low rates of biochemical invalidation reported in the literature may not generalize to certain ethnic minority populations.

Findings of significant reductions in smoking rate among nonabstinent participants from pretreatment to posttreatment assessment were based on self-report and may have been subject to reporting biases like those that affected self-reported abstinence. Thus these findings should be accepted cautiously.

Few of the psychosocial variables predicted abstinence status. The most salient predictor was negative partner interactions, with abstainers at 12-month follow-up reporting fewer negative partner interactions than nonabstainers. Negative partner behaviors such as nagging and harping on one's failures may be linked to poorer outcomes. The causal direction may be reversed, however, because failure to achieve or sustain abstinence may elicit more critical comments from partners. In all likelihood the relationship is reciprocal. Still, positive interactions may have less of a bearing on enhancing success in smoking cessation than negative interactions.

Though one should be cautious not to overinterpret marginally significant findings, it appeared that the presence of children living in the house was associated with better initial outcomes. This finding may have cultural relevance with respect to the importance placed in Hispanic cultures on family responsibility and setting a good example for one's children. Other psychosocial variables that have been predictive of smoking outcomes in earlier research, such as self-efficacy for resisting smoking temptations, failed to predict abstinence status in the

present study at any assessment panel. More research is needed to examine the validity of these measures in predicting change in health-related behaviors among Hispanics and other ethnic minorities.

Though the issue of relapse in smoking cessation programs is a vexing one, and certainly not limited to ethnic minority groups, the social and acculturative stresses faced by these groups present health behavior researchers with special challenges. There remains a need for new applications of low-cost, minimal-contact/self-help programs, perhaps including the use of nicotine-replacement therapies, that do not require regular attendance in clinic-based programs. Such programs, however, may not yield long-term benefits unless they offer some ongoing assistance to persons facing the risk of potential relapse.

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#### SO WHAT? Implications for Health Promotion Practitioners and Researchers

This study indicates that the initial benefits of a culturally specific, multicomponent behavioral smoking cessation intervention for Hispanic smokers do not persist over time. Combined with other research, there appears to be moderate support for the belief that more-intensive smoking interventions, even those offered in a culturally sensitive context, do not demonstrate any long-term benefits over minimal-contact programs that offer personalized feedback or brief counseling in addition to self-help materials. If these findings hold up, health behavior researchers may need to develop innovative applications of low-cost, minimal-contact/self-help programs that do not require regular attendance in more intensive, clinic-based programs.

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