

Reaching Spanish-Speaking Smokers: State-Level Evidence of Untapped Potential for QuitLine Utilization

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Television advertising is a credible and motivating source of information about smoking cessation among Latinos,¹ particularly those with low acculturation levels.² Spanish-language media may be a particularly useful way to reach low-acculturated Latinos.³

Paid media, including television and radio, are generally effective in increasing overall calls to QuitLines,^{4,5} which are an important evidence-based smoking cessation intervention.⁶ QuitLine coaching appears effective among a wide range of populations, including Latino smokers.^{7,8} For example, a Spanish-language television, radio, newspaper, and direct mail campaign increased Spanish calls from low-income Latino smokers to the National Cancer Institute's South Central Cancer Information Service, from fewer than 1 to almost 18 calls per month during the media campaign. Callers were eligible for enrollment in the *Adios al Fumar* (Goodbye to Smoking) study of an enhanced coaching intervention that included up to 4 coaching calls.⁸ Spanish-speaking callers in the *Adios al Fumar* study who called in response to the media campaign were reasonably adherent to treatment, with 83% of participants completing the full course of 4 counseling calls and 27.4% reporting 7-day abstinence at 3-month follow-up. This is particularly striking given that the Latino population was of very low socioeconomic status. We extended the work of *Adios al Fumar* in 3 ways: by focusing on media campaign effects, rather than an adjusted coaching protocol, QuitLine reach, and outcomes; by assessing media and QuitLine reach in a Latino population with substantial QuitLine use at baseline; and by assessing use of nicotine replacement therapy (NRT) among a Latino population that has historically underused NRT.⁹

We assessed QuitLine reach and effectiveness during a Spanish-language media campaign in Colorado. Several primary reasons motivated the creation of the media campaign program: Latino smoking prevalence in Colorado is 1.5 times the rate for White, non-Latinos

Objectives. We examined the effects of a Spanish-language media campaign on the reach and outcomes of a state-sponsored QuitLine among Latino smokers.

Methods. In this quasiexperimental (2-group, pre-post) study, we analyzed data from Colorado QuitLine callers before (April–August 2007) and during (September–November 2007) the media campaign. Call volume, service utilization, and quit rates at 7-month follow-up were compared between Latino (n=243) and non-Latino (n=527) callers.

Results. QuitLine calls increased among Latinos during the campaign by 57.6% (1169 vs 1842 in 3-month periods). Compared with precampaign Latino study respondents, Latino respondents during the campaign were significantly younger (younger than 45 years), more often Spanish speaking, uninsured, and less educated. Among Latino enrollees, program completion and nicotine replacement therapy use were similar before and during the campaign, and quit rates during the campaign improved marginally to significantly (7-day abstinence: 29.6% vs 41.0%, $P=.07$; 6-month abstinence: 9.6% vs 18.8%, $P=.04$).

Conclusions. A well-designed, statewide Spanish-language media campaign increased QuitLine reach and improved cessation outcomes among a young Latino population of low socioeconomic status. QuitLine-supported cessation can be increased among these smokers. (*Am J Public Health.* 2010;100:S165–S170. doi:10.2105/AJPH.2009.166322)

(22.8% vs 15.6%; $P<.001$),¹⁰ and 20.8% of Colorado Latino smokers spoke mainly Spanish at home in 2005. Additionally, Latino smokers historically have been underrepresented in the Colorado QuitLine (21.7% of smokers in 2005 vs 14.8% of QuitLine callers December 2005–June 2007).¹¹ Results of this study will inform researchers and tobacco control programs about effective cessation interventions in the Latino population.

METHODS

A commercial media firm under contract to the Colorado State Tobacco Education and Prevention Partnership designed the Spanish Latino QuitLine media campaign. The firm convened 6 focus groups, separately in English and Spanish, among low-income Latinos across Colorado. The groups focused on tobacco-related attitudes, knowledge about the QuitLine, and preferences regarding cessation messages. Participants reportedly preferred positive messages involving family themes to inspire

quitting and wanted to feel empowered to make their own decisions. Both English- and Spanish-speaking groups reported little awareness of the QuitLine and high rates of television viewing.

An ad campaign was developed that delivered positive, supportive, and encouraging messages about quitting through actors portraying key family members. Spots for this study aired in Spanish language only on predominantly Spanish-language television and radio and in Latino-attended movie theaters.

The campaign urged audience members who smoked to call the Colorado QuitLine, which offered free NRT and 5 proactive coaching sessions. During the precampaign study period, Colorado implemented a change in the NRT protocol; because of this change, the first 40% of study participants were eligible to receive 8 weeks of NRT, and the remainder during the precampaign period were eligible for 4 weeks. During the media campaign, Latino callers who referenced the media campaign and any caller who smoked

more than 20 cigarettes per day were eligible to receive two 4-week supplies of NRT.

Callers who did not reference the campaign and who smoked 20 or fewer cigarettes per day were eligible to receive a single 4-week supply.

The campaign aired in the fall of 2007 (September–November). Urban Colorado counties received the majority of campaign spots, but local health departments statewide were encouraged to supplement the campaign with local earned or paid media of their own.

Study Design and Data Collection

In this quasiexperimental (2-group, pre-post) study, we compared proportions and demographics of Latino QuitLine callers with all callers of other race/ethnicities (“non-Latinos”) before (“precampaign” April, July, and August 2007) and during (“campaign” September–November 2007) the media campaign. Although the precampaign period included small-scale QuitLine promotional events (e.g., county fairs), QuitLine call volume was not visibly affected.

QuitLine callers were eligible for the study if they had called for themselves during the precampaign or campaign study periods and answered the race/ethnicity question (i.e., data not missing). We obtained intake and service utilization data from the QuitLine database maintained by the vendor (National Jewish Health, Denver, CO). Outcome data among both precampaign and campaign callers were collected using a 7-month follow-up survey of a random sample of QuitLine callers during the study periods. Outreach for the follow-up survey consisted of a notification postcard at 1 and 3 months after first calling the QuitLine, a prenotification letter 1 week before the survey, and mixed-mode survey attempts by mail (3 attempts) and telephone (up to 12 attempts). Those who completed the follow-up survey received a modest incentive (\$2–\$5). The follow-up survey included items about smoking status, cessation behavior, NRT use patterns, intentions to quit smoking in the future, and QuitLine satisfaction.

We obtained media campaign data and costs from the Colorado State Tobacco Education and Prevention Partnership.

Analyses

Survey response rates varied nonsignificantly by study group and period, increasing slightly among Latinos from precampaign to campaign periods (44.1% vs 50.4%) and remaining slightly higher among non-Latinos from precampaign to campaign periods (54.3% vs 52.7%). Because nonuniform response rates can bias intent-to-treat analyses,¹² we performed only complete case outcome analyses for this report (i.e., we excluded outcomes for nonresponders from analyses of outcomes).

We analyzed respondents by study group (Latino vs non-Latino) and study period (precampaign vs campaign) for the following variables: demographic (gender, age, education, insurance status) and smoker characteristics (smokes ≤ 20 vs ≥ 21 cigarettes per day, time to smoking in morning, motivation to quit, confidence in quitting, quit attempt in past year, living with a smoker, and duration of smoking). We constructed a Spanish-language indicator variable on the basis of either primary language at home or QuitLine calls conducted in Spanish. These data were available for only 37.3% of QuitLine callers; we classified remaining callers (62.7%) conservatively as non-Spanish for analysis.

We also compared service utilization (program enrollment, coaching sessions, NRT shipments, 0 vs ≥ 1 days of NRT use, and duration of NRT use) and quit rates for each study group and period. The primary outcome measures were 7-day abstinence (point abstinence) and 6-month abstinence (prolonged abstinence) reported 7 months after initial QuitLine call. Seven-month follow-up is standard for QuitLine outcomes assessment, as it allows approximately 1 month for treatment delivery followed by a full 6-month potential period of abstinence after treatment.¹³ We performed the χ^2 test for differences between groups within and across periods for all categorical variables and the 2-sample Student *t* test to compare means.

We used logistic regression to assess the effect of demographics and service utilization on differential change in quit rates between study groups during the 2 study periods. We constructed separate logistic regression models for each quit outcome (7-day or 6-month abstinence) as the dependent variable, using the method recommended by Hosmer and

Lemeshow.¹⁴ The independent variable was an interaction term of study group (Latino vs non-Latino) by period (precampaign vs campaign), and we retained this variable in the model regardless of significance. We included the Spanish indicator as a covariate and tested other potential covariates univariately. Covariates were entered in the multivariate model if univariate statistical significance was less than .25 and were retained in the final model if multivariate significance was less than .05. Post hoc multiple logistic regression of the non-Latino population was conducted to delineate the cause of unexpected decreased quit rates in this population. For this non-Latino-only model, the study period (precampaign vs campaign) was the main independent variable, which we retained in the models regardless of significance, and we tested potential covariates and added them to the model as described.

We estimated costs per call and per quit using the total difference in Latino call volume during the campaign versus before the campaign, the costs of producing and airing the Spanish language campaign, and the estimated difference in number of abstinent Latino callers. We calculated the cost per additional call during the campaign by dividing the total cost of the campaign by the change in Latino call volume. We calculated the cost per additional quit (for 7-day abstinence and 6-month abstinence) by multiplying the response rate for the period by the total number of Latino callers during the period. We applied the respective abstinence rates to this simulated “complete case” number. We then divided the total campaign cost by the additional number of quits obtained during the campaign period.

RESULTS

A total of 770 study participants responded to the follow-up survey (51.4% response rate), including 243 Latinos and 527 non-Latinos. Overall, nonrespondents compared with respondents were more often younger than 45 years (72.7% vs 58.7%, respectively; $P < .001$) and more often uninsured (50.0% vs 37.1%, respectively; $P < .001$). Nonrespondents were less likely than respondents to have smoked for more than 10 years (82.6% vs 86.5%, respectively; $P = .04$). Survey nonrespondents were significantly different from respondents

on most service utilization measures. Compared with respondent program enrollees, nonrespondent program enrollees were less likely to complete the program (7.5% vs 19.8%, respectively; $P < .001$), more likely to complete only 1 call (48.4% vs 29.6%, respectively; $P < .001$), and less likely to be sent 2 NRT shipments (15.3% vs 21.6%, respectively; $P < .001$). These differences persisted across both race/ethnicity and campaign period, with the exception of NRT shipments during the campaign period, which were similar among respondents and nonrespondents.

Media Exposure

A total of 1387.4 television gross rating points were delivered on 3 metropolitan Denver Spanish-language stations, airing every other week September 24 through October 28 during key adult viewing times. Radio advertisements were targeted to the 3 primary urban Colorado markets: Metropolitan Denver; Colorado Springs–Pueblo; and Fort Collins–Greeley. In addition, 30-second Spanish language television spots aired 1900 times on Latino movie theater screens from October 11 through December 11. During the campaign, an estimated 79.8% of households were exposed to campaign messages an average of 12 times each.

QuitLine Call Volume

The total number of Latino QuitLine callers increased from 390 per month during the precampaign period (1169 over 3 months) to an average of 614 per month during the campaign (1842 over 3 months), including a high of 796 during the peak campaign month of October. Compared with precampaign Latino study respondents, Latino respondents during the campaign were significantly younger (younger than 45 years), more often Spanish speaking, uninsured, less educated, and marginally more often male (49.6% vs 40.5%; $P = .15$; Table 1). Latinos who responded during the campaign were less motivated to quit (“motivation to quit”; Table 1) and less confident about quitting (“belief in quitting for good”; Table 1).

Among non-Latino study respondents, slightly more were White, non-Latinos, and younger during the campaign compared with those responding precampaign. A small increase in Spanish-speaking non-Latino callers also occurred.

TABLE 1—Characteristics of Latino vs Non-Latino QuitLine Respondents Before and During a Spanish-Language Media Campaign: Colorado, April–August and September–November 2007

	Latino, Precampaign (n = 126), %	Latino, Campaign (n = 117), %	Non-Latino, Precampaign (n = 334), %	Non-Latino, Campaign (n = 193), %
Gender				
Men	40.5	49.6	50.0	41.5
Women	59.5	50.4	50.0	58.6
Age, y				
18–44	53.2	65.8*	53.9	64.8*
≥ 45	46.8	34.2*	46.1	35.2*
Race/ethnicity				
White	NA	NA	82.3	90.2*
African American	NA	NA	9.9	6.2*
Other	NA	NA	7.8	3.6*
Spanish speaking	4.8	40.2	0.3	2.1*
Education				
Less than high school	22.2	42.5*	10.9	10.1
High school or GED	35.7	38.1*	33.8	30.7
More than high school	42.1	19.5*	55.3	59.3
Uninsured	40.5	56.0*	32.2	32.2
Smoke > 20 cigarettes per d	21.4	16.5	26.8	30.7
Take < 30 min to smoke	76.0	69.6	75.4	77.3
Very motivated to quit	46.5	29.9*	47.5	46.0
Strong belief in quitting for good	38.5	15.8*	30.9	30.4
No attempts to quit in past y	41.5	44.3	46.6	50.3
Live with smoker	38.4	37.4	44.7	42.8
Smoked for > 10 y	88.9	90.5	87.0	81.5
Primary media exposure county	77.8	82.1	78.1	76.2

Note. NA = not applicable; GED = general equivalency diploma.

* $P < .05$ for within group campaign vs precampaign comparisons.

Service and Nicotine Replacement Therapy Utilization

Compared with the precampaign period, program enrollment among both Latinos and non-Latinos remained high and steady during the campaign (Table 2). Latino program enrollees during the campaign trended toward being less likely to stop being coached after 1 call, more likely to complete the program, and more likely to receive 1 NRT shipment compared with their precampaign counterparts (Table 2). Mean number of coaching calls during the campaign was marginally higher among Latinos than among non-Latinos (3.0 vs 2.6; $P = .06$). No change in coaching utilization occurred among non-Latino enrollees between campaign periods. Non-Latinos were

less likely to have 2 NRT shipments during the media campaign than before; reported NRT use was unchanged among both Latinos and non-Latinos during the campaign.

Quit Rates

Six-month abstinence was significantly higher among Latinos during the campaign than before the campaign (18.8% vs 9.6%; $P < .05$) and significantly lower among non-Latinos during the campaign compared with before the campaign (8.8% vs 16.5%; $P = .01$; Table 2). Seven-day abstinence showed a similar pattern, with marginally significant improvement among Latinos during the media campaign (41.0% vs 29.6%; $P = .06$) and significant worsening among non-Latinos (34.8% vs 24.9%; $P < .05$). Comparing the 2

TABLE 2—QuitLine Service Utilization and Quit Rates Among Latino vs Non-Latino Respondents, Before and During a Spanish-Language Media Campaign: Colorado, April–August and September–November 2007

	Latino, Precampaign	Latino, Campaign	Non-Latino, Precampaign	Non-Latino, Campaign
Enrolled, %	93.7	90.6	95.5	97.4
Completed only first call, %	32.2	23.6	30.1	30.3
Completed program, %	20.3	24.5	18.8	18.6
Call total, mean (95% CI)	2.7 (2.4, 3.0)	3.0 (2.7, 3.2)	2.7 (2.5, 2.9)	2.6 (2.4, 2.8)
NRT shipments, %				
0	7.6	4.7	9.7	9.6*
1	67.0	76.4	63.0	79.3*
2	25.4	18.9	27.3	11.2*
Used NRT, %	74.6	82.1	77.4	73.9
Days NRT used, median	28.0	30.0	28.0	28.0
Days NRT used, mean (95% CI)	32.3 (25.9, 38.7)	36.1 (29.8, 42.4)	33.2 (29.5, 36.8)	34.2 (28.6, 39.8)
7-d abstinence, %	29.6	41.0	34.8	24.9*
6-mo abstinence, %	9.6	18.8*	16.5	8.8*

Note. CI = confidence interval; NRT = nicotine replacement therapy.
* $P < .05$ for within group campaign vs precampaign comparisons.

groups, Latinos had significantly higher 7-day (41.0% vs 24.9%; $P = .003$) and 6-month (18.8% vs 8.8%; $P = .01$) abstinence than did non-Latinos during the media campaign.

In logistic regression analysis, quit outcomes varied by study period in opposite directions among Latinos versus non-Latinos, adjusted for program completion and days of NRT use. Adjusted odds of 7-day abstinence were 1.62 (95% confidence interval [CI] = 0.94, 2.79) among Latinos versus 0.60 (95% CI = 0.40, 0.91) among non-Latinos. Six-month abstinence showed a similar pattern, with adjusted odds of 2.15 (95% CI = 0.99, 4.66) among Latinos versus 0.46 (95% CI = 0.26, 0.83) among non-Latinos.

The non-Latino-only models produced similar results. Adjusted for program completion and days of NRT use, odds of 7-day abstinence during the campaign were 0.57 (95% CI = 0.38, 0.85; $P = .007$) compared with precampaign. Adjusted for program completion, days of NRT use, and NRT shipments, the odds of 6-month abstinence were 0.55 (95% CI = 0.30, 1.01; $P = .05$).

Costs

The Spanish-language component of the Latino media campaign cost \$145 900 for

production and \$91 287 for airtime, a total of \$237 187. Latino callers numbered 1169 during the 3-month precampaign period and 1842 during the 3-month campaign period, a difference of 673. The cost per additional Latino caller during the campaign was \$352. The cost per additional quit among Latinos during the campaign period ranged from \$1036 (based on 7-day abstinence) to \$1882 (based on 6-month abstinence).

DISCUSSION

A statewide Spanish-language media campaign increased QuitLine reach among younger Spanish-speaking Latinos with low socioeconomic status while maintaining or improving service completion rates and smoking cessation rates at 7-month follow-up among this population. We have extended previous research⁸ by reporting on (1) longer-term quit outcomes, (2) increased reach of QuitLine services in a Latino population with substantial QuitLine use at baseline, and (3) acceptance and use of NRT in a population previously shown to underuse NRT. The study contributes to the scant literature on effective cessation methods among Latinos and supports the evidence base for cessation programming among Latino populations.

Overall Latino QuitLine reach increased by 57.6% during the media campaign. Based on the noted caller differences in age and gender during the campaign, we have speculated that it was most effective at recruiting younger Mexican men living and working in Colorado. Young Mexican men comprise the largest demographic segment of US immigrants,^{15,16} and they come from a country where 39.1% of men are smokers.¹⁷ Given the size of this population, its disproportionately high need, the deadly consequences of tobacco addiction, and the potential availability of effective interventions, the results of this important study support the notion that it is possible to increase the reach of QuitLines with good success among Spanish-speaking US smokers.

The development of the Spanish Latino media campaign was consistent with other reports in the literature on the important aspects of addressing smoking cessation among Latinos. Many of the findings of the focus groups that were held before developing the campaign, such as the importance of *familismo*, or close family relationships,^{18,19} and the need for willpower to quit, were supported by previous research.^{19,20} Consistent with previous interventions, the media campaign used role models who decided to quit smoking in each advertisement.³ Additionally, a professional company with expertise in linguistic and cultural adaptation of Latino television and radio scripts was directly involved in the filming of the campaign material to ensure cultural relevance and appropriateness of the advertisements. Previous research has also shown significant barriers to using NRT among Latinos^{18,20} that the campaign did not address, with the exception of cost, which was addressed through the provision of NRT. Therefore, the finding that NRT use was similar before and during the media campaign among Latinos and compared with QuitLine callers of other race/ethnicities was encouraging. Previous research has shown that Latinos who tried NRT completed the same length course of NRT as other race/ethnicities.²¹ Perhaps future advertisement campaigns should more specifically address NRT barriers to reach Latinos who are less likely to use NRT.

The finding that quit rates among Latinos during the media campaign were similar or improved was very encouraging, especially as the Latino population was “higher risk” during

the media campaign with younger, less educated, uninsured, and less motivated and less confident callers. These populations have historically experienced lower quit rates.^{22–25} Additional research about changes in knowledge and attitudes about cessation, QuitLines, and NRT as a result of the media campaign is needed to determine the exact components of the media campaign that may have contributed to the improved quit rates. However, our results add strong support to the literature that well-designed Latino media campaigns are able to draw a Latino population to the QuitLine that is equally successful at quitting. It also shows that the “maximum” reach of the QuitLine, at least in the Latino population, has probably not been achieved.

Conversely, quit rates unexpectedly declined during the campaign among non-Latino QuitLine callers. This finding suggests that improved quit rates among Latino callers are unlikely to be the result of external influences on all smokers. In logistic regression modeling, NRT and coaching call utilization did not fully explain the decrease in quit rates among non-Latinos. However, the decreased quit rates may still be related to the NRT protocol change that occurred partway through the study that limited NRT to a 4-week supply instead of an 8-week supply. Further experimental research is needed to determine if reduced availability of NRT affects quit rates directly or indirectly through methods other than simply length of NRT use, such as motivation to make or continue the quit attempt.

Limitations

We did not have a direct measure of exposure to the media campaign. The evidence was strong among Latinos throughout Colorado that demographics, including Spanish language, changed statewide, so it was reasonable to include the whole Latino population as the intervention group. We do not feel this limitation altered our findings because it would, if anything, bias the study results toward the null if we had included callers in the study group who were not actually exposed to the intervention. However, we were limited in our ability to assess the direct effect of the media campaign on cessation-related knowledge and attitudes.

The QuitLine documented Spanish language use at home and during QuitLine calls

unreliably. As a result, we could assess only the lower limit of the proportion of Spanish-speaking callers who we reached and could not separately assess service utilization and outcomes by Spanish language use. Despite this limitation, the proportion of Spanish-speaking callers increased remarkably during the campaign.

There were significant differences between follow-up survey respondents and nonrespondents, mostly in service utilization. The differences were consistent across study groups and periods and should not affect the findings, although they may limit generalizability to those who participated more fully in treatment. We accounted for this limitation in the cost calculations by applying the quit rates only to the same proportion of the total callers as the response rate. This provided a conservative estimate of the additional quits that occurred during the media campaign while taking into account that the quit rate was probably different among nonrespondents.

The NRT protocol changed during the study, and NRT shipment eligibility may have differed between the comparison populations. Multivariate modeling controlled for the number of NRT shipments and days of NRT use in multivariate modeling, and neither factor eliminated the quit rate differences found in the study. The quasiexperimental study design precluded definitive conclusions about the effect of the changed NRT supply protocol on quit rates, particularly among non-Latinos.

Conclusions

Our findings show that a well-designed, Spanish-language, Latino media campaign reached a younger, more Spanish-speaking, low socioeconomic status Latino population through the Colorado QuitLine. In addition, callers during the media campaign accepted QuitLine services at a slightly higher rate and reported more improved outcomes than did previous Latino callers. Future research is needed to assess the components of the media campaign that affected change, if any, on cessation knowledge and attitudes of Latino smokers. Additionally, as the maximum reach of QuitLines to Latino smokers has not been determined, future research should include efforts to increase both the reach and the scope of Spanish-language media campaigns. ■

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This article was accepted August 3, 2009.

Contributors

E.K. Burns conceptualized and conducted the study, including analyses and writing. A.H. Levinson provided supervision of the study and significant reviews and revisions to the draft article.

Acknowledgments

The Colorado State Tobacco Education and Prevention Partnership, Colorado Department of Public Health and Environment funded this study (grant FLA 08-00233).

The authors would like to thank David Tinkelman, MD, National Jewish Health, for support in providing the Colorado QuitLine intake and utilization data for this study and a thorough review of the study draft.

Human Participation Protection

The Colorado multiple institutional review board approved this research.

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