

Feasibility and Effectiveness of a Community-Based Smoking Cessation Intervention in a Racially Diverse, Urban Smoker Cohort

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Cigarette smoking is the leading cause of preventable death and disease in the United States.¹⁻³ Although smoking rates have continued to decline since 1965, 2012 National Health Interview Survey data indicate that 18% of the adult population currently smokes.⁴ Continued efforts to promote smoking cessation are essential for helping the nation meet the 2020 health objective to reduce the prevalence of cigarette smoking among adults to 12%.⁵

Several behavioral and pharmacologic interventions for smoking cessation have been shown to be efficacious.⁶ As a result, the US Department of Health and Human Services Clinical Practice Guideline recommends that smokers be advised to use a combination of medication and behavioral treatment of smoking cessation.⁶ However, 2010 National Health Survey data indicate that evidence-based smoking cessation approaches are underused and not included in the majority (68.3%) of past year quit attempts.⁷ Behavioral interventions, including individual counseling, stop smoking classes, and telephone quit lines, were especially underutilized by smokers; they were reported to be used alone or in combination with medication in only 10.2% of smokers trying to quit.⁷

A range of tobacco prevention and control activities have resulted in the significant decline in smoking behaviors over the past 3 decades. The most wide-reaching and accessible methods used have been mass media smoking cessation campaigns via television, radio, print ads, and billboards.^{8,9} Although these campaigns are effective for reducing smoking prevalence at the population level, their effectiveness at the individual level is unclear.⁸⁻¹⁰ At the individual level, tobacco quit lines are highly accessible and effective, with estimated 6-month abstinence rates of 12.7%, but only

Objectives. We evaluated the feasibility, acceptability, and effectiveness, in addition to the effects of a psychoeducation-based orientation on smoking cessation knowledge for Courage to Quit (CTQ), an evidence-based smoking cessation intervention disseminated to racially diverse, urban community sites in Chicago, Illinois.

Methods. Smokers (n = 1494; 55% African American) enrolled in 6-session full (n = 945) or 3-session short (n = 549) versions of CTQ in 2008 to 2012.

Results. Orientation improved knowledge of efficacious and nonefficacious treatments. Acceptability was outstanding: more than 90% of participants would recommend CTQ. Feasibility was good: completion rates were 53% in the full and 75% in the short programs. Intent-to-treat quit rates were 19% in the full and 17% in the short programs (completer quit rates were 36% and 22%, respectively). Among completers, smoking cessation medication use was associated with higher quit rates. There were no racial disparities: African Americans and Whites showed similar completion and quit rates. Predictors of successful quitting were higher readiness to quit and smoking cessation medication use.

Conclusions. CTQ is moderately successful in the short term as delivered in community-based settings for urban-dwelling, largely minority smokers. Further evaluation of longer-term outcomes and cost effectiveness is warranted. (*Am J Public Health*. 2014;104:S620-S627. doi:10.2105/AJPH.2014.302097)

a small percentage of smokers (~1.2%) utilize them.^{6,11} By contrast, more intensive approaches, such as individual or group smoking cessation counseling, are more effective, with estimated 6-month abstinence rates of 16.8% and 13.9%, respectively, but less accessible, particularly in low-income and minority communities.⁶

Although randomized controlled trials have established the efficacy of treatment under conditions that maximize internal validity, the dissemination and implementation of evidence-based treatments in effectiveness research is greatly needed, as such “delivery as usual” programs maximize external validity and have the potential to achieve public health impact.¹² As Kessler and Glasgow have documented,¹³ an important limitation of the broader literature on health behaviors is that rapid advances in efficacy research are slow to translate into effectiveness research,

thus furthering the gap between research and practice.

Smoking cessation treatment disseminated at the community level offers a unique opportunity for effectiveness research. Several nonprofit organizations have implemented group and individual community-based smoking cessation programs (e.g., the American Lung Association’s Freedom From Smoking, the American Cancer Society’s Fresh Start), but research on program reach and outcomes is limited.¹⁴⁻¹⁶ In the few published studies on these programs, sample sizes have ranged from 43 to 494 participants, and intent-to-treat point-prevalence self-reported quit rates have ranged from 21% to 29% measured at various end-of-treatment or follow-up intervals.

Although race and ethnicity were not reported, these programs were conducted in regions with a high census of Whites (e.g., Iowa, Western New York, Delaware); hence there is

no evidence they were delivered to a sizeable number of minority smokers. Minorities are underserved in terms of accessibility to mainstream smoking cessation programs and may incur additional barriers to quitting smoking than do Whites.^{17–21} Furthermore, population-based surveys have documented that African American, Hispanic, younger, male, and uninsured individuals underutilize smoking cessation programs.^{7,18} There is a dearth of effectiveness research on acceptability, feasibility, and quit rates in evidence-based smoking cessation services delivered to racially diverse, urban community smokers.²²

An additional limitation of existing research on community-based smoking cessation programs is that effects of psychoeducational components, particularly early in treatment, have not been systematically assessed. Social cognitive models propose that knowledge, attitudes, and perceived social norms about the behavior influence behavior change²³ and that smokers with more knowledge about addiction and treatments are more likely to report intentions and attempts to quit.^{17,24–26} In the Freedom From Smoking program, predictors of successful quitting included program attendance, smoking less than 1 pack per day, and perceived helpfulness of group support.¹⁶ Overall, there is limited research on predictors of smoking cessation success in effectiveness trials, particularly in racially and ethnically diverse smokers.

We aimed to address some of the limitations of and extend previous research on the effectiveness of community-based smoking cessation programs. Specifically, our goal was to provide a field-based evaluation of the feasibility, acceptability, and end-of-program outcomes of an evidence-based, community-delivered smoking cessation intervention (Courage to Quit [CTQ]) delivered throughout Chicago, Illinois, starting in 2008. In 2010 to 2012, the CTQ program was largely expanded (approximately quadrupling enrollment) as part of the US Department of Health and Human Services' Communities Putting Prevention to Work initiative, a comprehensive prevention and wellness initiative that included community-based tobacco prevention.

In this effectiveness study, we evaluated (1) smoking cessation beliefs and knowledge before and after the initial CTQ

psychoeducation-based program orientation; (2) the acceptability, feasibility, and quit rates of the program, comparing the short and long versions of the program; and (3) predictors of successful smoking cessation. Secondary aims were to compare outcomes in African American versus White participants because of the known racial disparities in quit rates following smoking cessation treatments^{17–19} (with the exception of outcomes associated with state quit line use).^{27,28}

METHODS

The Respiratory Health Association of Metropolitan Chicago disseminated and implemented the CTQ program between 2008 and 2012 in partnership with community agencies with the goal of reaching underserved, minority, and low-income smokers. The program was given at no or low cost (with nominal fees for materials), and sessions were conducted in community health centers, nonprofit organizations, faith-based organizations (e.g., churches), housing programs, hospitals, substance abuse treatment centers, and academic institutions, many of which serve low-income and minority neighborhoods.

Both passive (e.g., program flyers) and active (e.g., direct contact with potential program participants) recruitment methods were used and individualized to the operational framework and capacity of each setting. The program was open to adult (aged 18 years and older) smokers interested in attending an initial program orientation and information exchange session. Those smokers interested in enrolling after the orientation signed an agreement form and thus constituted the intent-to-treat sample ($n = 1494$).

Intervention

The CTQ program is a semistructured and manualized smoking cessation intervention developed by a clinical psychologist (A. K.) in consultation with Respiratory Health Association of Metropolitan Chicago staff. The program has been used as a platform treatment in clinical trials in evaluating the efficacy of experimental medications or in underserved minority communities with 6-month biochemically confirmed point-prevalence quit rates ranging from 19% to 35%.^{29–32}

The CTQ program includes an orientation and psychoeducation session followed by 6 weekly sessions starting 2 weeks before the designated quit date and proceeding through 4 weeks after the quit date. The treatment modules include a progression of topics incorporating evidence-based behavioral, cognitive, and motivational smoking cessation strategies as outlined in the US Public Health Service Clinical Practice Guidelines for Treating Tobacco Use and Dependence.⁶

Orientation. The orientation session took approximately 20 to 30 minutes and provided psychoeducation on evidence-based interventions (e.g., behavioral counseling, nicotine replacement therapy) as well as non-evidence-based methods (e.g., lasers, hypnosis, acupuncture), challenged misconceptions and myths about these treatments, and informed participants about the program's nonjudgmental approach if a setback was experienced.

An earlier version of the orientation CTQ program included psychoeducation on weight gain and smoking cessation ($n = 190$), but this was later discontinued because of time constraints.

Program. In the CTQ program, the first 2 weekly sessions included behavioral, motivational, and self-monitoring skills, including identifying triggers, working through the decisional balance of change, and participating in self-monitoring "wrap sheets" to record each cigarette during the ensuing weeks. In the third session, the quit date, the program included modules for coping with craving, managing withdrawal symptoms, and planning for emergency situations and setbacks. The final 3 sessions included progressively more cognitive skills and reinforcement of motivation, including such topics as managing stress, learning self-talk and cognitive strategies to avoid rationalizing smoking, overcoming former reasons to smoke, and identifying high-risk situations and creating smoke-free coping strategies.

During the implementation of CTQ, various community organizations provided feedback that the 6-session format was not practical in their setting because clients may be available for only a few weeks, such as in temporary housing and shelters, so a condensed 3-session short CTQ version was developed to meet these needs. The short program was identical to the full program in module content but

truncated in length to include 1 session the week before the quit date, a session on the quit date, and a third session 1 week after the quit date. Behavioral and cognitive skills and topics were presented in briefer format. Once the short program was developed in 2010, each community site independently decided which version of CTQ best suited their setting and needs. More detail on the CTQ program can be found in King et al.²⁸

Training. Program facilitators completed a 1-day onsite training and certification session at the Respiratory Health Association of Metropolitan Chicago. Their backgrounds were diverse and included nurses, respiratory therapists, social workers, psychologists, counselors, and community organizers. All were current nonsmokers for at least the past 6 months, and all were instructed not to reveal their personal smoking (or nonsmoking) background.

CTQ was primarily delivered in a group format and has been translated into the native language of persons within several community neighborhoods in Chicago, including Spanish, Polish, and Mandarin Chinese. These versions facilitated outreach to ethnically diverse neighborhoods.

Measures

The demographic information collected included age, gender, race/ethnicity, marital status, employment status, and education level. The smoking-related data collected included age when participants started smoking regularly, smoking frequency and quantity, presence of another smoker in the household, and readiness to quit smoking.

In both the full and short programs, a short 8-item survey was given before the psychoeducation-based orientation to ascertain beliefs and knowledge about efficacious versus nonefficacious treatments. We rated each item on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) to assess participants' knowledge and beliefs about evidence-based smoking cessation treatments (e.g., medications, behavioral therapies) and non-evidence-based treatments (e.g., lasers, hypnosis, and herbals) as well as concerns about weight gain and feeling judged. We repeated the scale immediately after the orientation and followed it by a demographic and smoking behavior

questionnaire, including the Smoking Contemplation Ladder,³³ to assess readiness to quit smoking.

Finally, at the beginning of the last session (session 6 for full program, session 3 for short program), participants completed a post-treatment survey assessing past 7-day point-prevalence quit rates, use of stop smoking medications (e.g., nicotine replacement, bupropion, varenicline, or alternative treatments), and their rating on a 7-point scale of the likelihood that they would recommend the program to others.

Data Analysis

We analyzed the data of the 1494 smokers enrolled in the full ($n = 945$) or short ($n = 549$) programs. We imputed missing data (range of 0%–20% missing data for particular items) with a multiple imputation with regression switching approach by assuming the data were missing at random.^{34,35} We replaced each missing value with 10 plausible values, leading to 10 imputed data sets for further analyses.

We assessed pre–post changes in smoking cessation beliefs and knowledge in the entire sample (full and short program combined) via paired *t* test. We compared participant characteristics and program acceptability by *t* test or χ^2 analysis, as appropriate, in the full and short programs. We assessed acceptability by a dichotomous classification of “yes” (≥ 5 for mildly to strongly agree) or “no” (< 4 for neutral to strongly disagree) on recommending the program to others.

We assessed feasibility by program completion rates, that is, attendance at the last session with completion of the posttreatment survey, which we chose because community partner sites did not have resources available to provide detailed attendance data for each visit. By definition, the full and short programs varied on length of treatment, but because this study was an effectiveness trial, we compared the program types on feasibility (completion rates) and end-of-treatment quit rates to determine if there were different trends in these important outcomes.

We analyzed the primary outcome, 7-day point-prevalence quit rates at the end of treatment, first in the intent-to-treat sample with noncompleters conservatively classified as relapsed and then repeated in completers only.

Among program completers, we made additional comparisons of quit rates on the basis of use of smoking cessation medications. To evaluate potential racial disparities in program feasibility and outcomes, we compared self-reported African American ($n = 704$) and White ($n = 359$) program participants.

Finally, we used logistic regression models to examine demographic and smoking-related predictors of successful quitting. First, we conducted univariate logistic regressions to identify significant predictors of quitting from among the following: age, gender, education, race, ethnicity, postorientation improvement in knowledge items, smoking quantity and duration, other smokers in household, use of smoking cessation medication, and readiness to quit. Subsequently, we conducted multivariate logistic regressions with only those variables that were significant from univariate analyses. We conducted analyses in Stata version 12.1.³⁶

RESULTS

Table 1 summarizes baseline demographic characteristics, smoking behaviors, and program characteristics for the overall sample as well as the subset of participants in the full and short programs. Overall, program participants were diverse, ranging from age 18 to 82 years (mean = 46.4 years; SD = 12.87), with similar rates of men and women enrolled, and a preponderance of participants reporting African American/Black race (55%). Most participants were daily smokers, with the sample nearly equally divided between those smoking a half pack per day or less (49%) and those smoking more than a half pack per day (51%). The majority of participants were in the preparation or action stages of change (mean = 7.9; SD = 1.42; range = 1–10).

The program was primarily delivered in English (93%) and in a group setting (93%). The types of settings in which programs were implemented varied, with the most common settings being health services provider organizations, nonprofit organizations, faith-based organizations, and housing programs (Table 1). Participants in the full and short group formats were similar on most characteristics, except that participants in the full program were more

TABLE 1—Participant Baseline Characteristics: Courage to Quit; Chicago, IL; 2008–2012

Characteristic	Intent-to-Treat Sample (n = 1494), Mean ±SD or % (No.)	Missing Data, %	Full Program (n = 945), Mean ±SD or % (No.)	Short Program (n = 549), Mean ±SD or % (No.)	P
Demographics					
Age, y	46.40 ±12.90	11.8	48.26 ±11.80	43.60 ±13.90	< .001
Gender is female	53.00 (719)	9.2	57.40 (476)	46.10 (243)	< .001
Race		14.9			< .001
African American/Black	55.30 (704)		57.10 (460)	52.30 (244)	
White	28.20 (359)		32.90 (265)	20.10 (94)	
Other	16.50 (210)		10.10 (81)	27.60 (129)	
Ethnicity is Hispanic	17.60 (211)	19.9	10.40 (74)	28.40 (137)	< .001
Marital status		9.8			.51
Single	47.20 (636)		48.70 (401)	44.80 (235)	
Married or living as married	26.80 (361)		25.60 (211)	28.60 (150)	
Divorced or widowed	26.00 (351)		25.70 (211)	26.70 (140)	
Education		11.6			< .001
Some high school	21.80 (288)		16.40 (132)	30.10 (156)	
High school or some college	54.70 (723)		57.50 (462)	50.40 (261)	
College or higher	23.50 (310)		26.00 (209)	19.50 (101)	
Employment is full or part time	47.60 (618)	13.0	47.20 (372)	48.10 (246)	.01
Smoking and health variables					
Age started smoking regularly, y	19.00 ±6.00	13.7	18.70 ±5.89	19.60 ±6.27	.01
Contemplation ladder (range = 1–10)	6.90 ±0.10	29.6	7.20 ±0.06	6.60 ±0.07	< .001
Smoking frequency is daily	79.10 (1049)	11.2	80.60 (652)	76.80 (397)	.14
Cigarettes smoked/d		11.3			.01
> half a pack	50.70 (665)		47.90 (386)	55.30 (279)	
≤ half a pack	49.30 (646)		52.10 (420)	44.70 (226)	
Smoker in household = yes	47.60 (639)	10.1	45.40 (373)	51.10 (262)	.02
Program characteristics					
Language is English	93.00 (1390)	0.0	96.70 (914)	86.70 (476)	< .001
Modality is group	93.30 (1394)	0.9	93.00 (879)	93.80 (515)	.28
Site		2.5			< .001
Health service provider organization	37.30 (557)		29.30 (277)	51.00 (280)	
Nonprofit organization	21.80 (326)		27.00 (255)	12.90 (71)	
Faith-based organization	15.20 (227)		17.90 (169)	10.60 (58)	
Housing programs	10.60 (159)		6.50 (61)	17.90 (98)	
Substance abuse treatment center	7.40 (111)		7.20 (73)	6.90 (38)	
Other	5.50 (77)		8.10 (77)	0.00	

Note. Data are mean ±SD or valid percentages. We extracted the data from the intent-to-treat sample (those attending the first session).

likely to be women and older and to have more years of education than were those in the short program.

Beliefs and Knowledge About Smoking Cessation

Because the orientation session was identical across the full and short programs, we conducted pre–post orientation analyses on the entire sample.

The orientation session significantly improved participants’ beliefs and knowledge regarding efficacious and nonefficacious treatments, the safety of nicotine replacement, weight gain issues, and learning from slips or setbacks in quit attempts (Table 2).

Feasibility and Acceptability

The CTQ program showed generally good feasibility, with the completion rate for the full

program lower than that for the short program (53% vs 75%, respectively; odds ratio [OR] = 0.37; 95% confidence interval [CI] = 0.29, 0.46; $P < .001$), which was not surprising because it took place over twice as long an interval (6 vs 3 weeks). This effect remained even after controlling for participant characteristics that differed between the 2 types of programs.

The CTQ program also showed excellent acceptability across both program types.

TABLE 2—Beliefs and Knowledge About Smoking Cessation Pre- and Postorientation Session: Courage to Quit; Chicago, IL; 2008–2012

Question-Knowledge Item	No.	Pre-session, Mean (SE)	Postsession, Mean (SE)	<i>t</i>	<i>P</i>	Effect Size <i>d</i>
1. There are several stop smoking medications such as nicotine replacement (patch, gum, etc.), Zyban, and Chantix that have been shown by scientific evidence to improve one's chances of quitting smoking.	1258	5.32 (0.04)	5.94 (0.04)	12.73	< .001	0.38
2. Behavioral counseling, in a group or individual setting, has been shown by scientific evidence to improve one's chances of quitting smoking.	1255	5.16 (0.04)	5.84 (0.04)	14.49	< .001	0.41
3. There are several alternative techniques, such as lasers, hypnosis, acupuncture, and herbs that have been shown by scientific evidence to improve one's chances of quitting smoking.	1253	4.03 (0.05)	3.12 (0.05)	-15.39	< .001	0.43
4. Nicotine replacement products (patch, gum, lozenge, etc.) can cause cancer.	1246	2.95 (0.05)	2.09 (0.05)	-16.36	< .001	0.45
5. If I have a slip or setback, I will be judged by the program leader and participants and I will not be welcome to continue in the program.	1246	2.10 (0.05)	1.71 (0.04)	-8.12	< .001	0.23
6. Nicotine replacement products (patch, gum, lozenge, etc.) are just replacing one addiction to cigarettes with another addiction.	189	3.77 (0.05)	2.78 (0.05)	6.44	< .001	0.47
7. I cannot tolerate any weight gain at all when I quit smoking, even a few pounds.	190	4.24 (0.05)	3.67 (0.05)	4.24	< .001	0.31
8. If I gain weight when I quit smoking, I will have health risks of being overweight that are greater than the health risks of smoking.	189	3.11 (0.05)	2.60 (0.05)	3.48	< .001	0.25

Note. For items 1–5, we used data imputation, and the means and significance tests are on the basis of $n = 1494$. The sample size was smaller for items 6–8 because we discontinued some items during the early phase of program delivery to decrease the burden on participants.

Among program completers, 90% of those in the full and 95% of those in the short program indicated they would recommend CTQ to others (OR = 1.22; 95% CI = 0.63, 2.38; $P = .56$).

Program Outcomes

Point-prevalence quit rates were similar for participants in the full versus the short program (19% [180/945] vs 17% [91/549], respectively; OR = 1.18; 95% CI = 0.88, 1.58; $P = .28$). In contrast, among completers, the quit rate was higher in the full than in the short program (36% [180/503] vs 22% [91/415], respectively; OR = 1.98; 95% CI = 1.48, 2.67; $P < .001$). These effects remained even after controlling for participant characteristics that differed between the 2 types of programs.

Among completers, 37% of those in the full and 48% of those in the short program reported using an approved smoking cessation medication (i.e., nicotine replacement, bupropion, or varenicline). Furthermore, those using smoking cessation medication had higher quit rates than did those not taking a medication (full program: 39% vs 29%, respectively; OR = 1.56; 95% CI = 1.04, 2.32; $P = .03$; short program: 27% vs 13%, respectively; OR = 2.45; 95% CI = 1.41, 4.26; $P = .002$).

Predictors of Quit Rates

For the full program, baseline predictors of success in quitting smoking using univariate analyses included higher education (any college vs noncollege: OR = 1.56; 95% CI = 1.07, 2.28; $P = .02$), higher readiness to quit smoking (OR = 1.19; 95% CI = 1.02, 1.38; $P = .03$), use of smoking cessation medication (OR = 1.60; 95% CI = 1.06, 2.42; $P = .004$), and improved knowledge after the orientation on nicotine replacement safety (OR = 1.11; 95% CI = 1.03, 1.22; $P = .01$). In multivariate analyses with all these variables included in the model, all remained significant independent predictors of success in quitting smoking.

In the short program, baseline predictors of success in quitting smoking using univariate analyses included higher education (any college vs noncollege: OR = 1.87; 95% CI = 1.11, 3.13; $P < .001$), absence of other smoker in the household (OR = 1.79; 95% CI = 1.06, 2.70; $P = .03$), higher readiness to quit smoking (OR = 1.41; 95% CI = 1.18, 1.69; $P < .001$), and use of smoking cessation medication (OR = 2.27; 95% CI = 1.30, 3.93; $P = .004$). In multivariate analyses with all these variables included in the model, all remained significant independent predictors of success in quitting smoking, with the exception of education.

Comparisons Between African American and White Smokers

We observed no differences between African American and White smokers for program feasibility or quit rates for either program type (Table 3). There were no racial differences in the use of smoking cessation medication (41% among African Americans vs 40% among Whites; OR = 1.15; 95% CI = 0.79, 1.67; $P = .43$).

For both African American and White participants, baseline predictors of success in quitting smoking using univariate analyses included higher readiness to quit smoking (African Americans: OR = 1.25; 95% CI = 1.05, 1.48; $P = .01$; Whites: OR = 1.29; 95% CI = 1.03, 1.60; $P = .03$) and use of smoking cessation medication (African Americans: OR = 1.73; 95% CI = 1.09, 2.75; $P = .02$; Whites: OR = 2.02; 95% CI = 1.06, 3.85; $P = .03$). Both of these variables remained significant independent predictors of quitting success in multivariate analyses.

DISCUSSION

To our knowledge, this is the first evaluation of the effectiveness of CTQ, a community-based program for smoking cessation disseminated to

TABLE 3—African American (n = 704) vs White (n = 359) Participant Comparison on Feasibility and Quit Rates in the Intent-to-Treat Sample: Courage to Quit; Chicago, IL; 2008–2012

Outcome	Overall (n = 1063), %	Full (n = 725), %	Short (n = 338), %
Feasibility of program completion			
African American	63.4	59.4	70.9
White	61.8	58.5	71.3
Quit rates			
African American	17.6	19.8	13.5
White	21.5	24.2	13.8

Note. There were no significant differences in feasibility or quit rates between African American and White participants ($P > .05$) in the overall sample, full program, or short program.

underserved smokers, including racial minority and low-income urban smokers. Our results showed modest, yet encouraging short-term, preliminary outcomes for CTQ in terms of improving knowledge and beliefs about smoking cessation, feasibility, acceptability, and quit rates.

The brief 20-minute orientation and psychoeducation module delivered before starting the intervention significantly improved beliefs and knowledge about effective strategies to quit smoking (i.e., nicotine replacement medication and behavioral interventions), while challenging common myths and beliefs about alternative strategies that have no evidence base (e.g., hypnosis, lasers, herbals). Additionally, participants corrected misconceptions about the known safety of nicotine replacement products and improved concerns about the impact of quitting smoking on weight and about being judged in the program for having a setback during a quit attempt.

Improving smokers' knowledge about what smoking cessation treatments work and do not work and addressing concerns about weight gain or being judged in the program may be important preliminary targets of intervention, as previous research indicates that greater knowledge of addiction and smoking cessation treatments is associated with higher intentions and attempts to quit.^{17,24–26}

Feasibility and acceptability, which are often barriers to successful large-scale program dissemination, were relatively favorable. More than 9 in 10 participants reported they would recommend the program to others who are interested in quitting smoking, which confirms

that the program was perceived to target smoking cessation, as intended, and was well suited to the goal of meeting the needs of this diverse sample. Factors that may have significantly contributed to high rates of program acceptability, especially among racial minority and low-income smokers, include offering this evidence-based program at no or low cost and in easily accessible and trusted community settings.

The program completion rate was 53% in the full and 69% in the short program; as expected, program completion was higher in the short than in the long version of the program, likely because the short program was 50% shorter. Program completion rates, although moderate, are encouraging for this large-scale, urban community-based program with majority enrollment of African Americans, who in prior smoking cessation trials either have been underserved (i.e., there were no targeted outreach efforts) or have been challenging to recruit and retain, despite consistently reporting high levels of interest in smoking cessation.^{37–39}

The overall quit rates in CTQ were modest, yet encouraging in both the full (19% in intent to treat, 36% in completers) and short (17% in intent to treat, 22% in completers) programs; however, it is important to note that these are short-term and preliminary outcomes. Although the quit rates in this study are moderate, they are similar to those reported in other large-scale, community-based smoking cessation programs (i.e., Freedom From Smoking and Fresh Start).^{14–16} Notably, these mainstream smoking cessation programs included

primarily White smokers with little racial diversity or did not address race and ethnicity issues. CTQ enrolled more African American than White smokers, with comparable outcomes and predictors of success between these racial groups. This is in contrast to previous research indicating African Americans show lower quit rates and participation in smoking cessation trials^{40–43} (with the exception of outcomes associated with state quit line use).^{27,28}

Furthermore, the likelihood of quitting smoking was greater among completers of the more intensive and longer full program than among those of the short program (36% vs 22%, respectively). This pattern of better outcomes for more intensive behavioral intervention and use of smoking cessation medication is consistent with the Tobacco Treatment Guidelines.⁶ Finally, predictors of successful quitting common to both programs included higher readiness to quit and use of smoking cessation medication. Improvement in knowledge about the safety of nicotine replacement products and higher education were predictors of quitting only for those in the full program, whereas the absence of other smokers in the household was a predictor of quitting only for those in the short program. Overall, predictors of smoking cessation in this study are consistent with previous research that motivational factors, degree of nicotine dependence, and socioeconomic stability reliably influence smoking cessation success.^{44,45}

Strengths and Limitations

There are numerous strengths to this study, including evidence-based smoking cessation program development; enrollment of urban, racially diverse smokers who are often underserved and underrepresented in research; successful program dissemination and implementation in partnership with community organizations; and evaluation of effectiveness.

However, our results should be considered in light of study limitations. First, the community partners did not have the resources necessary to collect detailed data on attendance or to specify any program modifications that they may have made, such as the availability of incentives or no-cost nicotine replacement therapy. Therefore, it was not possible to conduct a more detailed evaluation of the

potential association between program adherence or of the availability of incentives or nicotine replacement therapy and outcomes.

Second, there was substantial attrition, which is not uncommon in effectiveness research in community settings.⁴⁶

Third, although previous research suggests that self-reports tend to underestimate smoking status,⁴⁷ it was not feasible to conduct biochemical verification of smoking status in this large-scale dissemination effort.

Finally, the long-term maintenance of smoking cessation is unknown beyond the end of treatment. We did not assess smoking cessation outcomes after treatment completion because this effectiveness trial in real-world community settings was not equipped for follow-up incentives, extensive participant tracking that would be complex in a lower income sample, and collecting detailed personal and collateral information.

Conclusions

We have provided initial support of the effectiveness of the CTQ program, an evidence-based, community-based smoking cessation intervention disseminated in partnership with community organizations. CTQ was especially successful in reaching and promoting smoking cessation among urban African American smokers, a traditionally hard to reach and underserved population. Consistent with previous research, the best program outcomes (i.e., quit rates) were evident for the full program, which offers a higher dose of intervention, and for those using smoking cessation medications in either the full or short programs.

Our results are a meaningful contribution to efforts to link efficacy findings to real-world effectiveness research.^{12,13} It is encouraging that despite challenges inherent to program implementation in nonclinical trials settings, outcomes were largely favorable. However, that a small percentage of CTQ program participants quit smoking highlights the need for additional research on strategies to optimize smoking cessation outcomes. Future research is also necessary to examine whether individual characteristics (e.g., nicotine dependence, depression) can help clinicians make evidence-based decisions about the level of intervention intensity necessary to influence quit rates; evaluate longer-term smoking cessation

outcomes; and determine the cost effectiveness of CTQ relative to less resource-intensive smoking cessation programs (e.g., state quit lines). ■

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Contributors

Y. Asvat, as lead author, contributed to literature review, data analyses, data interpretation, and article preparation. D. Cao contributed to developing and executing the data analyses plan, data interpretation, and article preparation. J. J. Africk contributed to the study's design and implementation and article editing. A. Matthews contributed to literature review, data interpretation, and article editing. A. King, as principal investigator, was responsible for the study's conceptualization and design, including development of the intervention and data interpretation and article preparation.

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Human Participant Protection

The study was approved by the University of Chicago institutional review board.

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