Published in final edited form as:

J Health Care Poor Underserved. 2016 ; 27(1): 35–50. doi:10.1353/hpu.2016.0017.

A Community-Based Participatory Research on Smoking Cessation Intervention for Urban Communities

Fernando A. Wagner, ScD, MPH,

Prevention Sciences Research Center, and School of Community Health and Policy, Morgan State University, Baltimore, MD

Payam Sheikhattari, MD, MPH,

Prevention Sciences Research Center, and School of Community Health and Policy, Morgan State University, Baltimore, MD

Ms. Jane Buccheri,

CEASE Initiative, Baltimore, MD

Ms. Mary Gunning,

CEASE Initiative, Baltimore, MD

Ms. Lisa Bleich, and

CEASE Initiative, Baltimore, MD

Ms Christine Schutzman

Prevention Sciences Research Center, and School of Community Health and Policy, Morgan State University, Baltimore, MD

Abstract

Smoking disproportionately affects minority and underserved populations but only a handful of interventions tailored to these populations have demonstrated effectiveness in real-life situations. We use community-based participatory research (CBPR) to test two interventions delivered by a community-based health care center.

Methods—Participants randomly assigned to individual or group-based intervention for smoking cessation (N= 400). Both included cessation counseling and health education, a contingency behavioral program, Nicotine Replacement Therapy, and health care for other comorbidities. Smoking cessation was verified by expired carbon monoxide at the end of the program.

Results—No differences were observed between the two treatment modalities (8.9% and 8.6%, respectively). Those with greater attendance had 1.4 times better odds of cessation per additional session. Retention and follow up proved to be challenging with this population.

Keywords

CBPR; smoking cessation; intervention studies; vulnerable populations

Tobacco use, particularly smoking, continues to disproportionately affect those with lower educational attainment or living in poverty despite the tremendous progress made since the 1998 Master Settlement Agreement.¹ Not only do inner-city populations and certain minority groups have higher rates of nicotine use but also they suffer disproportionately from higher rates of tobacco-related health problems, such as lung cancer and emphysema.² While current federal regulations are in place to prevent tobacco companies from targeting underage individuals and other vulnerable populations, enforcement is rare and the tobacco industry spends more than ever in cutting-edge marketing strategies, such as greater concentration of point-of-sale ads, promotional sales, and innovative packaging and products.^{3,4} A public health approach that effectively combines preventive education, policy change, and enforcement with convenient and effective smoking cessation interventions that help eliminate health disparities related to nicotine continues to prove elusive. However, the hugely disproportionate burden of tobacco-related death and disease borne by people of color and the poor is not a medical mystery, and its solution does not necessarily require high-tech interventions. Research studies have provided evidence of increasingly effective tobacco treatment as a result of various interventions, particularly those that combine Nicotine Replacement Therapy (NRT), cognitive-behavior therapy, and the use of contingency management strategies.^{5–7} However, while these methods are effective among carefully delimited populations and in controlled settings, doubts remain about their generalizability among larger populations and especially among those disproportionately affected with entrenched patterns of tobacco use. An approach that may prove more productive might require engaging these communities in the search and implementation for measures to eliminate health disparities associated with tobacco use. Without input from these communities it is unlikely that (a) interventions would be effective even if research-based, or that (b) these and other communities would embrace the research findings or recommendations.⁸ Hence, we undertook a community-based participatory research (CBPR) project to develop collaboratively a series of smoking cessation interventions that would work with a population characterized by low incomes and low educational attainment. According to the Agency for Healthcare Research and Quality (AHRQ), CBPR involves: (1) co-learning and reciprocal transfer of expertise, (2) shared decision-making power, and (3) mutual ownership of the processes and products of the research enterprise.⁹ The current project implemented a series of initiatives in phases that met the standard criteria of CBPR as described by AHRQ and in prior research by several researchers.^{9–11} This article describes Phase I of the project, in and with the community, as well as the impact of the findings on the design of a subsequent intervention.

Methods

Partnership formation and the CBPR process

The project began in 2002 with a community survey conducted with several partnering local organizations. The survey provided information on community needs and assets, and identified tobacco use as one of the residents' top health problems. A local health care organization (a federally qualified health center [FQHC]), which had strong interest in tobacco cessation, was an early partner. Through this center the project connected with other service providers and community leaders. Several small-group sessions were held in the

community to discuss the main results of the 2002 survey, and the process expanded the original network. The formation of potential partnerships was the subject of at least four meetings with community stakeholders (i.e., residents, community representatives/organizers, and service providers) where health disparities caused by tobacco were discussed, as well as new funding made available through the new partnership with the FQHC. Through self-selection, a core group was formed. The Community Advisory Board (CAB) was created after further recruitment efforts; formal applications were reviewed and the community members already engaged conducted interviews of prospective members. Formation of the CAB gave the project a formal decision-making process. After that, all decisions, technical and non-technical, were discussed and approved by the CAB through consensus-building processes. To expedite progress, the CAB created task-force groups that facilitated more targeted discussions and dynamic communication across all collaborators involved in the project, including community residents, service providers, university partners, and project staff.

The focus on smoking cessation was chosen on the basis of the original community survey and the terms of the request for applications issued by the National Institute of Minority Health and Health Disparities (NIMHD). The CAB fully committed to the topic as community members became more aware of the health disparities associated with tobacco in their community. The goal was to use CBPR to improve on an early intervention for smoking cessation. The first CAB decision was to formally test the existing approach because that would provide a reference for the evaluation of future interventions. The CAB became the “community expert” for the intervention, but they were also the ultimate decision-making authority. For example, the CAB decided when the intervention would start and finish, who would be included or excluded from the services, what kind and level of incentives to use, how recruitment and follow up would be conducted, how the data would be analyzed, and how and when the findings would be reported to other community partners and residents. The CAB and the academic partners wrote that report and all other materials for publication in partnership.

Overview of the CBPR-experimental research

Two smoking cessation interventions were compared. Both interventions used an adaptation of the American Cancer Society’s FreshStart curriculum,¹² a behavioral contingency management program, and access to Nicotine Replacement Therapy (NRT). The adaptations were introduced to accommodate the lower educational attainment of the target population as well as other literacy issues. They included extending the number of sessions from four to 12, and adding examples to each of the topics. The primary difference between the two interventions was the delivery modality (Group A consisted of individual counseling, and Group B was group counseling). Sessions in Group A were delivered by a nurse practitioner or physician. Sessions in Group B were delivered by a social worker and a nurse practitioner. Nicotine Replacement Therapy was made available to participants in both groups after clinical review by the nurse practitioner or physician and referral to the clinic’s pharmacy. Participants were referred for free health care if other co-morbidities were identified, especially in the case of DSM-IV (mental health) disorders.¹³ The behavioral contingency management program included incentives for attending sessions and achieving special goals,

such as establishing a quit date or staying quit for one week and one month. Incentives were in the form of \$5 gift cards for groceries. Participants in Group B were expected to attend all 12 scheduled sessions. Participants in Group A could attend up to 12 sessions but the frequency and scheduling were determined with their clinician, according to the standard of care at the health care facility. After completion of the interventions attempts were made to follow participants monthly for the first six months, with a final follow at nine months. Participants were invited to the follow-up sessions through phone calls and mailed letters.

Population, setting, and sample

Research has been an important part of the ongoing CBPR partnership between researchers from a Historically Black University (HBCU) and the surrounding urban community located in the Mid-Atlantic region of the United States, where half of the residents were Black and the other half were White, but all equally poor and underserved. The target community is relatively homogeneous, with a racial diversity index of 43.1. This index reflects the chance of randomly choosing two people in a neighborhood and who are of different race or ethnicity; 43% indicates a relatively low diversity in this community.¹⁴ The median household income was \$27,754, compared with Baltimore City's median income of \$40,100 per year.¹⁴ Community residents also have similar socio-environmental exposures compared with many other disadvantaged urban communities in the U.S., including high levels of tobacco advertisement, lack of or limited availability of tobacco cessation programs, longer distances to health care resources, and large blocks of abandoned homes and business, among others.^{8,15}

The setting for the intervention was a community-based primary health care clinic located in the target community. As explained earlier, investigators, health providers, and community stakeholders were identified and invited to form a Community Advisory Board (CAB), manage the partnership and oversee the design, implementation, and evaluation of the interventions. The Phase I intervention was designed through extensive consultation and collaboration among all partners, and based on available data from the community as well as the best practices of smoking cessation intervention science.

Since cost is an important barrier to health care access, the CAB decided that the intervention should be free of charge to participants (i.e., entirely paid by the research grant). Community partners also advocated for relatively lenient inclusion/exclusion criteria. Eligible participants were defined as any community resident or current patient from the clinic who smoked three or more cigarettes per day and was 18 years or older. The two exclusion criteria were: (a) participants not eligible to receive services from the health care clinic; and (b) participants with acute mental problems, such as disruptive or aggressive behavior that would prevent them or other participants from actively engaging in the group activities. Acute mental problems were identified during the recruitment process and early sessions by the clinical staff at the health care center. The initial sample for the trial was recruited through word of mouth, distribution of flyers designed by community members, and in collaboration with merchants and service providers from the community. A total of 437 participants were recruited for this trial between 2010 and 2011. However, complete data for the analyses was available for only 400 of them.

Group allocation

After completing an informed consent process, each participant received an encoded identification number to protect his/her identity and completed a baseline questionnaire. Each participant then received a welcome letter indicating assignment to either Group A or B, based on random numbers.

Constructs and assessments

Tobacco use—Current tobacco use was assessed via standard questions from the National Survey of Health and Drug Use and the Maryland Tobacco Use Survey.¹⁶ The Fagerstrom Nicotine Dependence Index¹⁷ was also used to determine appropriate dose to participants who accepted using NRT, ensure there were no significant differences between the treatment arms in severity of dependence, and as a covariate in regression models to help explain the outcomes. Tobacco cessation was evaluated based on self-reported smoking abstinence verified by clinical and para-clinical measures including expired-air carbon monoxide (CO) levels, and nicotine withdrawal symptoms.

Stage of tobacco involvement—*Stage of tobacco involvement* was measured using the scale developed by Prochaska and DiClemente,¹⁸ and adapted by Donovan and collaborators.¹⁹ Scale scores were then recoded into a dichotomous variable indicating readiness or absence of it.

Stress—*Stress* is a strong covariate of tobacco use. In this project, stress was measured using the Perceived Stress Scale developed by Cohen and colleagues.²⁰ This scale proved useful in this community in a prior study.²¹

Perceived social support—*Perceived social support* was measured through an adaptation of the Duke-UNC Functional Social Support Questionnaire²² that had also been used in this community.²¹

Other covariates—To minimize the burden on participants, data on age, gender, race/ethnicity, medical history, co-morbidities, medications prescribed, history of substance abuse disorders, whether NRT was prescribed to participants, and session attendance were obtained from the patients' medical records.

Quality control and quality assurance

To assure fidelity in the delivery of the interventions, a weekly meeting was attended by all staff involved in the project to discuss any challenges in the implementation of the interventions. Regardless of group assignment, detailed notes were required for each smoking cessation session documenting topics discussed, group dynamics, attendance, and clinical data specific to each participant. Researchers then obtained de-identified data from participants' clinical records to complement information about treatment plans and ancillary services received. Other qualitative methods included individual in-depth interviews with participants, staff and partners, and focus groups conducted to enrich the understanding of the findings acquired through quantitative methods.

Statistical analyses

The baseline data and subsequent data forms were entered into the STATA 11.2 software for computerized analyses.²³ The initial bivariate analyses documented that treatment randomization had adequately made the research groups comparable in every way at baseline (Table 1). Table 2 presents results of the intervention from bivariate analyses. Intent-to-treat analyses are presented to account for the fact that, unfortunately, not all participants could be followed up. It was assumed that participants for whom outcome data were not available had not quit smoking. These analyses are presented in the Results section, where multivariate logistic regression is used to control simultaneously for all variables in the model (Table 3).

Results

Participants' socio-demographic characteristics, by group allocation, are reported in Table 1. Essentially, no differences were found between the groups across socio-demographic characteristics at the conventional probability level of 0.05 for statistical significance. A relatively even distribution by age is observed (mean = 45.0 years; standard deviation, sd, = 10.5; range 19–69; $p = .265$), as well as for gender (overall, 41.3% males, 58.7% females; $p = .499$). Participants were mostly African Americans (69.7%) or Whites (26.5%). Level of school attainment was relatively low given that one third of the participants had only “some high school” (38.2%) and only one fourth had “at least some college” (24.5%). Also important to note is that 62% reported not working. Most participants had high (55.2%) or moderate (37.5%) levels of dependence as gauged by the Fagerstrom Nicotine Dependence Index. Also of note is that a large number of participants had been diagnosed with a DSM-IV Substance Abuse Disorder in their lifetime (19.3% overall, with no significant statistical differences by group). Baseline measurements indicated that about half of all participants had the highest levels of readiness to quit (53%). In spite of relatively high levels of stress (mean = 3.2; sd = 0.6; range 1–5; $p = .133$), participants also reported having high levels of social support (mean = 3.7; sd = 1.0; range 1–5; $p = .351$). Finally, Table 1 shows no difference on session attendance by group (mean = 2.7; sd = 2.4; range 1–12; $p = .338$). In summary, no major differences were observed at baseline between the groups, indicating that the randomized allocation resulted in similar groups at baseline.

Table 2 conveys results from bivariate analyses about quit smoking outcome and other covariates, based on an “Intent-to-Treat-Approach.” No differences by assignment group were observed among participants at the statistical level (8.9% and 8.6% for Group A and Group B, correspondingly, with $\chi^2(1) = 0.013$ and $p = 0.908$). The variables associated with a favorable outcome were number of sessions attended (mean of 4.8 sessions among those who quit smoking vs. 2.5 sessions among those who did not quit; $p < .0001$), and having a history of substance abuse disorder (15.6% of those with a history quit smoking vs. 7.1% among those with no history; $\chi^2(1) = 5.578$ $p = .018$).

Table 3 shows results from multivariate analyses where all variables are incorporated simultaneously into the model. Two panels are included. The first panel conveys results of the “Intent-to Treat” analysis including all participants ($n=400$) under the assumption that participants who were not available for follow up had not quit smoking. The second panel in

Table 3 depicts estimates based solely on observed data (i.e., those 201 participants for whom final assessment data on smoking was available). After controlling for these variables, still no statistically significant difference emerged between group assignment and quitting smoking (OR=0.9; 95% CI= 0.4–1.9, p-value= 0.717, as shown in Panel “A”). More frequent session attendance in the quit smoking program was associated with higher odds of quitting (OR= 1.4 per session; 95% CI= 1.1–1.6; p-value <0.0001). Once other variables were controlled for; history of drug dependence was no longer found to be associated with the odds of quitting smoking (OR=1.7; 95% CI= 0.7–4.1; p-value=0.489). Results depicted in the second panel of Table 3, where only observed data are used, convey results similar to the “Intent-to-Treat” analyses. In summary, the only variable that seems to be associated with quitting smoking in these interventions, at least at the level of statistical significance, is the number of sessions attended (OR = 1.2; 95% CI= 1.0–1.5; p-value= 0.018).

Finally, ancillary data analyses were conducted to compare baseline characteristics of drop-out cases with those for whom exit interviews were available (even if they withdrew before completing the program). The only baseline measurement that was found to be associated with attrition was readiness to quit, with an inverse association indicating that those who were higher on the readiness scale had lower odds of dropping out compared with those with lower readiness (OR= 0.6; 95% CI= 0.4–1.0; p-value = .032). Not surprisingly, those with higher session attendance also had lower odds of dropping out (OR= 0.7; 95% CI= 0.6–0.8; p-value < .001). The data are not shown in a table but are available upon request.

Discussion

This project aimed at developing an intervention that would fit the needs of people who are typically underserved, socially disengaged, and have higher rates of tobacco use than the overall population. To achieve this aim, a community-based participatory research approach was implemented. More than 400 participants were recruited and randomly assigned to either an individual or group intervention; participants in both interventions achieved similar cessation rates of 8.9% and 8.6%, respectively. Thus, it can be concluded that a group-based program delivered by a team of a social worker and a nurse/ physician achieves outcomes similar to those of multiple individualized cessation programs delivered by nurses and physicians offered at a community-based health care center. Although the quit rates were not as high as expected at the initiation of the project, they are comparable and in some instances higher than effectiveness rates reported in clinical trials that had carefully selected out less advantaged populations.^{24,25}

To summarize our approach and results we use the RE_AIM model²⁶ in the following chart.

REACH. 400 current smokers were recruited to participate in the intervention. This is about 12 times the number recruited in the previous year to the community based intervention. Participants were from a diverse sociodemographic background and many of them (19%) were suffering from other co-morbidities (e.g., chronic illnesses, other drug addiction, and mental health disorders).

EFFICACY. About 9% of participants were able to quit smoking. No differences were observed between “Individual” and “Group” interventions.

ADOPTION. The only health care center in the community was engaged in the intervention. Fresh-Start curriculum was tailored and expanded to meet the needs of a diverse group of participants.

IMPLEMENTATION. Extensive notes were taken to document the implementation process during the counseling sessions. Weekly teamwork meetings were held to maximize fidelity. Lessons learned from the implementation research and process evaluation were used to identify areas for improvement.

MAINTENANCE: Building on lessons learned in Phase I, a new approach was designed to give birth to a Phase-II intervention, which we describe below.

However, before we discuss the main findings in detail, it is necessary to acknowledge some important limitations of the present study, including the low retention rate in this community research and measurement challenges. Two sets of issues derive from poor retention: possible selection bias due to differential attrition; and low statistical power to detect differences. While both threats to validity should be acknowledged, it is important to remember the few and unrestrictive inclusion and exclusion criteria used for the intervention. Community members and researchers noted that often clinical trials use criteria that would actually screen out most residents of the targeted community;²⁷ therefore, they were willing to accept a trade-off between potential threats to internal validity in favor of data that would produce results more applicable to their actual population. This is not a minor point if we consider how seldom research focuses on the most needy populations, and communities adopt research the findings.

Other limitations relate to a lack of more refined measurements. Level of tobacco addiction at baseline was self-reported based on questions from national surveys and the Fagerstrom Test, and smoking cessation was only confirmed by CO monitoring tests that could be confounded by environmental and other exposures (such as marijuana use). However, self-report and CO measures were similar in most cases, especially after the initial measures.

In addition, because of the very low follow-up rates that could be achieved with this population, in spite of intensive efforts, the data was censored at the end of the 12th week, i.e., at the end of the intervention. Admittedly, many studies have followed participants for longer periods, and relapse rates are high during the first year after quitting.^{7,24,25} Yet, none of the data collected in this research suggests that treatment effects differ for individual or group interventions, and this is an important lesson learned. In addition, the close to 9% cessation rate represents much improvement over the 4–7% achieved without assistance.

Data from clinical charts were used to reduce the burden on participants, but may contain errors, particularly regarding patients' gender, race, and past medical needs and care.²⁸ However, this option was chosen for three reasons: (1) the FQHC had strong policies pertaining to the accuracy of clinical records; (2) some data, such as medical history and past medical care, would still otherwise have to be self-reported, relying on accurate recall and willingness to report; and, (3) the cost of deploying clinical interviewers to double check the data would mean providing less service to fewer participants, which the CAB opposed.

Notwithstanding these limitations, this study offers new evidence about the role of community partnerships in improving tobacco cessation services for disenfranchised, low-income populations. The apparent lack of interest smokers had in quitting, or at least in receiving services from the community health care center, was one of the biggest challenges we faced. In the year before this study, only a handful of participants were recruited for the smoking cessation program. The main barriers identified by community partners during the

design phase of this research were recruitment and retention. To address the recruitment barrier, a broad outreach effort was launched. Through person-to-person communication, community networking, and advertising, the partnership was able to recruit about 14 times as many participants compared with the year prior to the project launch.

The other challenge, participant retention, was not as easy to overcome. One out of every two participants did not complete the program. This is important in light of results indicating that the intervention was most effective for those who attended more sessions, regardless of the treatment modality. Although only a minority of participants attended six–12 sessions, they were three times as successful at quitting smoking compared with those who attended fewer than six sessions (OR= 2.8; 95% CI=1.2–6.3, data not shown in a table). Additional qualitative research was conducted to gain additional insight to attrition. A number of factors affecting retention were mentioned during the focus groups and in-depth interviews with participants who either completed or did not complete the program, regardless of whether they had quit smoking. Factors affecting retention included: lack of transportation; safety concerns (especially for night/ evening sessions); unmet expectations about incentives; bi-directional distrust between community and health care providers; mismatches between participants and providers regarding expectations on NRT, in addition to the heterogeneity among participants about nicotine replacement (some were willing to use NRT and others opposed it based on religion and health beliefs).

Because this trial is part of an ongoing CBPR project, learning and consensus-building are integral parts of the iterative process of research, analysis, and discussion. In fact, this trial was conceptualized as Phase I of a series of studies to identify the most critical elements that would help make smoking cessation programs effective for underserved populations. That is to say, in lieu of a maintenance plan, the initiative implemented an iterative research approach that capitalizes learning at each phase of the work into subsequent phases. Due to this expectation, results from Phase I were embraced by the CAB and other partners as a base that should guide subsequent interventions. The lack of significant differences in cessation outcomes between the group and individual modalities was considered good news because group interventions are less costly than individualized interventions, and can be facilitated by a broader base of providers. Furthermore, self-support group cessation can be conducted in many different community settings outside the clinics, thereby increasing access and reducing potential liabilities.²⁹ An anonymous reviewer reminds us of the usefulness of these insights for the work of FQHC, where being able to include larger number of participants in group cessation services than in individualized care programs can free up significant resources for other health care needs.

Lessons learned from Phase I led the CAB to design a new Phase II, through which cessation services are delivered at community sites (e.g., churches, schools, recovery centers), by specially trained peer motivators using different group counseling models with additional motivational interviewing exercises and games. The new behavioral contingency plan doubles Phase-I incentives for session attendance and milestone achievement. Additionally, participants who wish to use NRT receive it at the end of each session instead of having to exchange a voucher for it at a pharmacy. (More details of Phase II will be

provided in a subsequent article, but we hope readers will appreciate how the lessons learned at one phase help shape those in the subsequent phase in an iterative, progressive process.)

The CBPR approach created a partnership between community members and researchers that enriched the design, implementation, evaluation and success of the smoking cessation intervention. Phase I informed what is required to effectively help low-income populations quit smoking. The findings from this study suggest that the most efficient way of addressing the tobacco problem might be through mobilizing and retooling these communities to provide necessary ongoing support to those who want to adopt healthier lifestyles.

Acknowledgments

The authors wish to express their appreciation to Dr. Anne Marie O'Keefe for valuable editorial support. This research received financial support from the National Institute on Minority Health and Health Disparities (grants MD000217 and MD002803), the National Institute on Drug Abuse (Grants DA012390, DA019805); and Pfizer Inc.

References

1. Schroeder SA. Tobacco control in the wake of the 1998 master settlement agreement. *N Engl J Med*. 2004 Jan 15; 350(3):293–301. Epub 2004 Jan 11. <http://dx.doi.org/10.1056/NEJMs031421>. [PubMed: 14715919]
2. Pandya, P., Perveen, G. Prevalence and disparities in Chronic Obstructive Pulmonary Disease (COPD) and its related health-care utilization among Kansans-2011 Kansas Behavioral Risk Factor Surveillance System (BRFSS). Presented at: 2013 Council of State and Territorial Epidemiologists Annual Conference; Atlanta (GA). Apr 2013;
3. Ling PM, Glantz SA. Using tobacco-industry marketing research to design more effective tobacco-control campaigns. *JAMA*. 2002 Jun 12; 287(22):2983–9. DOI: 10.1001/jama.287.22.2983 [PubMed: 12052128]
4. Wakefield MA, Terry-McElrath YM, Chaloupka FJ, et al. Tobacco industry marketing at point of purchase after the 1998 MSA billboard advertising ban. *Am J Public Health*. 2002 Jun; 92(6):937–40. DOI: 10.2105/AJPH.92.6.937 [PubMed: 12036782]
5. Elfeddali I, Bolman C, Candel MJ, et al. The role of self-efficacy, recovery self-efficacy, and preparatory planning in predicting short-term smoking relapse. *Br J Health Psychol*. 2012 Feb; 17(1):185–201. Epub 2011 Jun 27. <http://dx.doi.org/10.1111/j.2044-8287.2011.02032.x>. [PubMed: 22107073]
6. Krishnan-Sarin S, Duhig AM, McKee SA, et al. Contingency management for smoking cessation in adolescent smokers. *Exp Clin Psychopharmacol*. 2006 Aug; 14(3):306–10. DOI: 10.1037/1064-1297.14.3.306 [PubMed: 16893273]
7. Prado GF, Lombardi EM, Bussacos MA, et al. A real-life study of the effectiveness of different pharmacological approaches to the treatment of smoking cessation: re-discussing the predictors of success. *Clinics (Sao Paulo)*. 2011; 66(1):65–71. DOI: 10.1590/S1807-59322011000100012
8. Andrews JO, Tingen MS, Jarriel SC, et al. Application of a CBPR framework to inform a multi-level tobacco cessation intervention in public housing neighborhoods. *Am J Community Psychol*. 2012 Sep; 50(1–2):129–40. DOI: 10.1007/s10464-011-9482-6 [PubMed: 22124619]
9. Israel BA, Schulz AJ, Parker EA, et al. Review of community-based research: assessing partnership approaches to improve public health. *Annu Rev Public Health*. 1998; 19:173–202. DOI: 10.1146/annurev.publhealth.19.1.173 [PubMed: 9611617]
10. Israel, BA, Eng, E, Schulz, AJ, et al., editors. *Methods in community-based participatory research for health*. San Francisco, CA: Jossey-Bass Publishers; 2005.
11. Viswanathan, M., Ammerman, A., Eng, E., et al. *Community-based participatory research: assessing the evidence*. Rockville, MD: Agency for Health care Research and Quality; 2004.
12. American Cancer Society. *Freshstart*. Atlanta, GA: American Cancer Society; 2009.

13. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th. Washington, DC: American Psychiatric Association; 2000.
14. Baltimore Neighborhood Indicators Alliance (BNIA). Who we are. Baltimore, MD: BNIA; 2014. Available at: <http://www.bnijfi.org>
15. Flint AJ, Novotny TE. Poverty status and cigarette smoking prevalence and cessation in the United States, 1983–1993: the independent risk of being poor. *Tob Control*. 1997 Spring;6(1):14–8. DOI: 10.1136/tc.6.1.14 [PubMed: 9176981]
16. United States Substance Abuse and Mental Health Services Administration. Results from the 2007 National Survey on Drug Use and Health: national findings. Rockville, MD: U. S Substance Abuse and Mental Health Services Administration; 2008.
17. Fagerstrom KO, Schneider NG. Measuring nicotine dependence: a review of the Fagerstrom Tolerance Questionnaire. *J Behav Med*. 1989 Apr; 12(2):159–82. DOI: 10.1007/BF00846549 [PubMed: 2668531]
18. Prochaska, JO., DiClemente, CC. The transtheoretical approach: crossing traditional boundaries of therapy. Malabar, FL: Krieger Pub Co; 1994.
19. Donovan RJ, Jones S, Holman CD, et al. Assessing the reliability of a stage of change scale. *Health Educ Res*. 1998 Jun; 13(2):285–91. DOI: 10.1093/her/13.2.285 [PubMed: 10181026]
20. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav*. 1983 Dec; 24(4):385–96. DOI: 10.2307/2136404 [PubMed: 6668417]
21. Jagers RJ, Wagner FA, Scott-Johnson PE, et al. Elevated depressive symptoms in a community sample of African-Americans and Whites. *J Health Dispar Res Pract*. 2007 Fall;2(1):21–34.
22. Broadhead WE, Gehlbach SH, de Gruy FV, et al. The Duke-UNC functional social support questionnaire. Measurement of social support in family medicine patients. *Med Care*. 1988 Jul; 26(7):709–23. DOI: 10.1097/00005650-198807000-00006 [PubMed: 3393031]
23. StataCorp. Stata statistical software: release 12. College Station, TX: Stata Corp LP; 2011.
24. Ahluwalia JS, McNaghy SE, Clark WS. Smoking cessation among inner-city African Americans using the nicotine transdermal patch. *J Gen Intern Med*. 1998 Jan; 13(1):1–8. DOI: 10.1046/j.1525-1497.1998.00001.x [PubMed: 9462488]
25. Lipkus IM, Lyna PR, Rimer BK. Using tailored interventions to enhance smoking cessation among African-Americans at a community health center. *Nicotine Tob Res*. 1999 Mar; 1(1):77–85. DOI: 10.1080/14622299050011181 [PubMed: 11072391]
26. Glasgow RE, Bull SS, Gillette C, et al. Behavior change intervention research in health care settings: a review of recent reports with emphasis on external validity. *Am J Prev Med*. 2002 Jul; 23(1):62–9. DOI: 10.1016/S0749-3797(02)00437-3 [PubMed: 12093425]
27. Rothwell PM. External validity of randomised controlled trials: “to whom do the results of this trial apply?”. *Lancet*. 2005 Jan 1-7; 365(9453):82–93. DOI: 10.1016/S0140-6736(04)17670-8 [PubMed: 15639683]
28. Gordis, L. Epidemiology. 4th. Philadelphia, PE: Elsevier Inc; 2009.
29. Blum JD. An analysis of legal liability in health care utilization review and case management. *Ann Hous L Rev*. 1989 Jan.;191–228.

SAMPLE CHARACTERISTICS BY RANDOMLY ALLOCATED GROUPS IN THE CEASE QUIT SMOKING INTERVENTION, PHASE I (N=400)

Table 1

Characteristic	Group A Individual (n=202)		Group B Group (n=198)		All participants (n = 400)		p-value ^d
	n	%	n	%	n	%	
Gender							
Male	80	39.6	85	42.9	165	41.3	
Female	122	60.4	113	57.1	235	58.7	chi2(1) = 0.456 Pr = 0.499
Race/ Ethnicity							
African American	145	71.8	134	67.7	279	69.7	
White	48	23.8	58	29.3	106	26.5	chi2(1) = 1.375 Pr = 0.241 ^b
Other	9	4.4	6	3.0	15	3.8	chi2(2) = 1.937 Pr = 0.380
School Attainment							
Some high school	73	36.1	80	40.4	153	38.2	
Graduated high school	76	37.6	73	36.9	149	37.3	
At least some college ^c	53	26.3	45	22.7	98	24.5	chi2(2) = 0.994 Pr = 0.608
Occupation							
Working or other	80	39.6	71	35.9	151	37.8	
Not working	122	60.4	127	64.1	249	62.2	chi2(1) = 0.597 Pr = 0.440
Nicotine Dependence							
Low	13	6.4	16	8.1	29	7.3	
Moderate	77	38.1	73	36.9	150	37.5	
High	112	55.4	109	55.1	221	55.2	chi2(2) = 0.418 Pr = 0.811
Drug Dependence ^d							
No	157	77.7	166	83.8	323	80.7	
Yes	45	22.3	32	16.2	77	19.3	chi2(1) = 2.4058 Pr = 0.121
Readiness to Quit							
No	98	48.5	90	45.5	188	47.0	

Characteristic	Group A Individual (n=202)		Group B Group (n=198)		All participants (n = 400)		p-value ^a
	n	%	n	%	n	%	
Yes	104	51.5	108	54.5	212	53.0	chi2(1) = 0.3759 Pr = 0.540
Age (in years, range 19–69)	45.6	10.32	44.4	10.73	45.0	10.5	Pr(T > t) = 0.2645
Stress (range 1–5)	3.2	0.5	3.2	0.6	3.2	0.6	Pr(T > t) = 0.6651
Social Support (range 1–5)	3.8	1.0	3.6	1.1	3.7	1.0	Pr(T > t) = 0.0537
Sessions attended (range 1–12)	2.6	2.1	2.8	2.6	2.7	2.4	Pr(T > t) = 0.3384

Notes:

^aPearson group differences

^bComparing African American and White participants only across groups

^cIncludes participants who attended Trading School

^dHistory of Drug Dependence

^eBased on t-test of no difference between groups

RESULTS OF THE CEASE QUIT SMOKING INTERVENTION, PHASE I (N=400) FROM BIVARIATE, INTENT-TO-TREAT ANALYSES

Table 2

Characteristic	Quit Smoking n = 35		Did not Quit n=365		All participants n = 400		p-value ^d
	n	%	n	%	n	%	
Intervention							
Individual	18	8.9	184	91.1	202	50.5	
Group	17	8.6	181	91.4	198	49.5	chi2(1) = 0.0132 Pr = 0.908
Gender							
Male	19	8.1	216	91.9	235	58.7	
Female	16	9.7	149	90.3	165	41.3	chi2(1) = 0.3154 Pr = 0.574
Race/ Ethnicity							
African American	26	9.3	253	90.7	279	69.7	
White	7	6.6	99	93.4	106	26.5	chi2(1) = 0.7226 Pr = 0.395 ^b
Other	2	13.3	13	86.7	15	3.8	chi2(2) = 1.1193 Pr = 0.571
School Attainment							
Some high school	14	9.2	139	90.8	153	38.2	
Graduated high school	11	7.4	138	92.6	149	37.3	
At least some college ^c	10	10.2	88	89.8	98	24.5	chi2(2) = 0.639 Pr = 0.726
Occupation							
Working or other	16	10.6	135	89.4	151	37.8	
Not working	19	7.6	230	92.4	249	62.2	chi2(1) = 1.035 Pr = 0.309
Nicotine Dependence							
Low	4	13.8	25	86.2	29	7.3	
Moderate	14	9.3	136	90.7	150	37.5	
High	17	7.7	204	92.3	221	55.2	chi2(2) = 1.297 Pr = 0.523
Drug Dependence ^d							
No	23	7.1	300	92.9	323	80.7	

Characteristic	Quit Smoking n = 35		Did not Quit n=365		All participants n = 400		p-value ^a
	n	%	n	%	n	%	
Yes	65	15.6	12	84.4	87	19.3	chi2(1) = 5.5784 Pr = 0.018
Readiness to Quit							
No	172	91.5	16	8.5	188	47.0	
Yes	193	91.0	19	9.0	212	53.0	chi2(1) = 0.0255 Pr = 0.873
Age (in years, range 19–69)	45.56	10.31	43.91	11.61	44.74	11.0	Pr(T > t) = 0.1334
Stress (range 1–5)	3.2	0.6	3.2	0.5	3.2	0.6	Pr(T > t) = 0.5941
Social Support (range 1–5)	3.7	1.4	3.5	0.9	3.7	1.0	Pr(T > t) = 0.3510
Sessions attended (range 1–12)	4.77	3.78	2.48	2.17	2.68	2.39	Pr(T > t) < 0.0001

Notes:

^aPearson group differences

^bcomparing African American and White participants only across groups

^cIncludes participants who attended Trading School

^dHistory of Drug Dependence

^eBased on t-test

RESULTS OF THE CEASE QUIT SMOKING INTERVENTION PHASE I, FROM MULTIVARIATE ANALYSES

Table 3

Characteristic	Intent-to-treat (n=400)			Observed data only (n=201)		
	OR	95% CI	p-value	OR	95% CI	p-value
Group A	1.0	Reference	—	1.0	Reference	—
Group B	0.9	0.4–1.9	0.717	1.1	0.5–2.6	0.742
Male	1.0	Reference	—	1.0	Reference	—
Female	1.4	0.7–3.1	0.350	1.7	0.7–4.0	0.210
African American	1.0	Reference	—	1.0	Reference	—
White	0.8	0.3–2.1	0.605	0.7	0.2–2.2	0.538
Other	1.6	0.3–9.0	0.616	1.4	0.2–10.5	0.734
Some high school	1.0	Reference	—	1.0	Reference	—
Graduated high school	0.7	0.3–1.6	0.369	0.7	0.3–1.9	0.502
At least some college ^a	0.6	0.2–1.7	0.347	0.5	0.2–1.6	0.253
Working or other	1.0	Reference	—	1.0	Reference	—
Not working	0.5	0.2–1.2	0.125	0.5	0.2–1.1	0.098
Nicotine Dependence Low	1.0	Reference	—	1.0	Reference	—
Nicotine Dependence Moderate	0.8	0.2–3.3	0.810	1.1	0.3–4.6	0.920
Nicotine Dependence High	0.7	0.2–2.6	0.584	0.8	0.2–3.2	0.710
No NRT Treatment ^b	1.0	Reference	—	1.0	Reference	—
Received NRT	0.7	0.2–2.0	0.489	0.5	0.2–1.7	0.289
No History of Drug Dependence	1.0	Reference	—	1.0	Reference	—
Drug Dependence History	1.7	0.7–4.1	0.252	1.6	0.6–4.1	0.361
Not ready to quit at baseline	1.0	Reference	—	1.0	Reference	—
Ready to quit at baseline	0.9	0.4–2.0	0.815	0.7	0.3–1.6	0.409
Age (in years, range 19–69)	1.0	1.0–1.1	0.080	1.0	1.0–1.1	0.063
Stress (range 1–5)	1.4	0.7–2.7	0.368	1.7	0.8–3.5	0.194
Social Support (range 1–5)	0.8	0.5–1.2	0.243	0.7	0.4–1.1	0.080
Sessions attended (range 1–12)	1.4	1.1–1.6	<0.001	1.2	1.0–1.5	0.018

Notes:

^aIncludes participants who attended Trading School

Measure not available at baseline OR= Odds Ratio 95% CI = 95% Confidence Interval

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript