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Effect of a smoking cessation intervention for women in subsidized neighborhoods: A randomized controlled trial

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Abstract

Objective—To evaluate the effectiveness of a community based participatory research (CBPR) developed, multi-level smoking cessation intervention among women in subsidized housing neighborhoods in the Southeastern US.

Methods—A total of n = 409 women in 14 subsidized housing neighborhoods in Georgia and South Carolina participated in this group randomized controlled trial conducted from 2009 to 2013. Intervention neighborhoods received a 24-week intervention with 1:1 community health worker contact, behavioral peer group sessions, and nicotine replacement. Control neighborhoods received written cessation materials at weeks 1, 6, 12, 18. Random coefficient models were used to compare smoking abstinence outcomes at 6 and 12 months. Significance was set a $p < 0.05$.

Results—The majority of participants (91.2%) were retained during the 12-month intervention period. Smoking abstinence rates at 12 months for intervention vs. control were 9% vs. 4.3%, $p = 0.05$. Additional analyses accounting for passive smoke exposure in these multi-unit housing settings demonstrated 12 month abstinence rates of 12% vs. 5.3%, $p = 0.016$. However, in the multivariate regression analyses, there was no significant effect of the intervention on the odds of being a non-smoker (OR = 0.44, 95% CI: 0.18–1.07). Intervention participants who kept coach visits, attended group sessions, and used patches were more likely to remain abstinent.

Conclusions—This CBPR developed intervention showed potential to engage smokers and reduce smoking among women in these high-poverty neighborhoods. Effectiveness in promoting cessation in communities burdened with fiscal, environmental and social inequities remains a public health priority.

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Keywords

Tobacco use; Group randomized controlled trial; Social determinants of health; Public housing neighborhoods

1. Introduction

There continues to be growing evidence of disparities in smoking rates and resultant health disparities among low socioeconomic, racial and ethnic minority women in disenfranchised, high poverty neighborhoods (Centers for Disease Control and Prevention, 2009a; National Cancer Institute, 2013; Andrews et al., 2014a). There are an estimated 4.8 million households living in US government subsidized housing, with the majority of these households led by single African American women (National Low Income Housing Coalition, 2012). The smoking prevalence of African American women in US subsidized housing neighborhoods is two to three times higher than the African American women in the general population (40–60% vs. 19%) (Andrews et al., 2014a; Grady et al., 1998; Manfredi et al., 1992; Jeffries et al., 2005; Centers for Disease Control and Prevention, 2009b). Despite a later onset of smoking initiation and smoking fewer cigarettes per day than their White and other racial/ethnic counterparts (Fagan et al., 2007), African American women experience difficulty with cessation and remaining abstinent (Trinidad et al., 2011).

The convergence of individual, social, and neighborhood factors for women in subsidized housing creates an environment in which smoking is a social norm (Andrews et al., 2014a). Women in government subsidized housing report poor physical and mental health (Ruel et al., 2010; Krieger and Higgins, 2002), high rates of depression and substance abuse (Williams and Adams-Campbell, 2000; Andrews et al., 2007a), limited access to financial and health resources (Ruel et al., 2010), and neighborhoods with high crime and disorder (Andrews et al., 2014a; Yu et al., 2012; Turney et al., 2013; Haberman et al., 2013). Even with these challenges, women in subsidized housing want to quit smoking and promote a healthier life for their children and grandchildren (Grady et al., 1998; Manfredi et al., 1992; Andrews et al., 2007a). However, there remains limited evidence of effective cessation interventions due to limited access and participation in trials for impoverished, racial and ethnic minority women. Recommendations call for culturally tailored and community preferred smoking cessation interventions in these high-risk populations (Landrine and Corral, 2014; Andrews et al., 2012a).

To address this critical gap, a community-based participatory research (CBPR) approach was utilized in partnership with subsidized public housing residents and housing administrators over the past decade to develop a socio-culturally preferred and accessible intervention (Andrews et al., 2007a; Andrews et al., 2012a; Andrews et al., 2007b). The culturally tailored intervention, AKA, *Sister to Sister*, adopts cessation strategies at multiple levels (i.e., individual, interpersonal, and neighborhood) based on the social ecological framework (Stokols, 1992; Green et al., 1996; Centers for Disease Control and Prevention (CDC), 1999) and community preferences. The purpose of this study was to evaluate the effectiveness of

the *Sister to Sister* intervention on biochemically validated smoking abstinence outcomes at 6 and 12 months.

2. Methods

Detailed descriptions of the methods, intervention, and measures are provided elsewhere (Andrews et al., 2012a). Briefly, a group randomized design was used with the neighborhood as the unit of randomization. Government subsidized neighborhoods (e.g., public housing and Section 8) in Augusta, Georgia and Charleston, South Carolina were included that had at least 100 households in a clustered site and that had not been used in previous studies. Of the 34 subsidized housing neighborhoods in these two regions, the study was implemented in the 14 neighborhoods that met eligibility. Seven matched pairs were formed of the 14 subsidized neighborhoods based on size and geographical location and randomly assigned one neighborhood in each pair to either the treatment condition (*Sister to Sister*) or a delayed control condition. Neighborhoods included in the study ranged in size from 100 to 352 households, with 27–32 participants enrolled in each neighborhood. Permission from the respective housing administration and tenant associations was received in each neighborhood prior to the start of the study.

Information sessions with refreshments were held in each neighborhood. During the information sessions, interested women were screened, consented, enrolled, and baseline data were collected. Inclusion criteria for study participants were: female over 18 years of age, currently living in the respective neighborhood, current smoker (at least 100 cigarettes in her lifetime and at least one cigarette daily), thinking about quitting smoking in the next 6 months, exhaled carbon monoxide (CO) ≥ 9 ppm, and salivary cotinine ≥ 15 ng/dl (SNRT Subcommittee on Biochemical Verification, 2002). Exclusion criteria were: pregnant or breastfeeding, acute psychotic disorder, or plans to move in the next 12 months. Once blinded data collectors completed baseline data on participants for a matched pair of neighborhoods, the statistician notified the study intervention staff to which condition the neighborhood had been randomized. All women enrolled in the study received a graduated remuneration at the end of each data collection ($25 gift card at baseline and week 6; $50 gift card at 6 months; $75 gift card at 12 months).

This study was approved by the Institutional Review Boards at the Medical University of South Carolina, Georgia Regents University, and the University of South Carolina.

2.1. Sister to Sister intervention

Women in neighborhoods randomized to the *Sister to Sister* intervention received a 24-week bundled multi-level intervention. The intervention is described in more detail elsewhere (Andrews et al., 2012a). Individual-led strategies were led by paid community health workers (termed “coaches” in the field). The community health workers provided 1:1 contact with participants to reinforce educational content and behavioral strategies from the group sessions, social support with the quitting process, and enhanced self-efficacy with cessation attempts. The community health workers and participants met in the participants’ homes or a designated place in the neighborhood (i.e., community center) weekly for 12 weeks, every other week for 4 weeks, and every 4 weeks for 8 weeks. Community health

workers scheduled visits at a time convenient with the participant the week prior with a follow-up phone call before the scheduled visit, and made three attempts to maintain each visit with each participant.

A certified smoking cessation counselor led behavioral group sessions in each intervention neighborhood using the *Sister to Sister* handbook (Andrews et al., 2012a) based on the Public Health Service Guidelines (Fiore et al., 2013). The weekly group sessions were initiated during the 1st week of the intervention, with a total of 6 group sessions over a 6-week period. An 8-week supply of transdermal nicotine patches were offered to participants who set a quit date (targeted at week 2 of the intervention) with weekly to bi-weekly supplies administered after the group sessions.

Within the 24-week study period, the neighborhood tenant association, in partnership with study staff, implemented at least two neighborhood level anti-smoking activities, such as a memory walk for family members who died from smoking-related illnesses, neighborhood health fair, and/or neighborhood cookout with anti-tobacco educational handouts. Each tenant association received $500 for the two neighborhood activities.

2.2. Delayed control intervention

Women in the delayed control condition received culturally sensitive smoking cessation written materials at week 1, and mailed materials at week 6, 12, and 18. At the end of the study (i.e., after the 12 month data collection), participants were offered counseling, nicotine patches, and community health worker contacts.

2.3. Primary outcome

The primary outcome evaluated in the study was biochemically verified 7-day point prevalence abstinence from smoking assessed at 6 and 12 months. At baseline, all participants had a confirmatory exhaled CO and saliva cotinine to verify presence of smoking (inclusion criteria). At follow-up assessments, women who self-reported smoking abstinence provided exhaled CO and saliva cotinine to validate abstinence outcomes.

2.4. Study variables

At baseline, the Fagerstrom Test for Nicotine Dependence (Heatherton et al., 1991) was assessed with possible scores ranging from 0 to 10, with higher scores indicating higher dependence. The 10-item Center for Epidemiology Scale-Depression (CES-D) was used to measure depressive symptomatology and mood (Radloff, 1977; Andresen et al., 1994) with possible scores ranging from 0 to 30, and scores > 10 indicating presence of significant depressive symptoms. Using two items, social smoking influences were assessed (Number of close friends who smoke? Number of people who live in your household smoke, not counting you?). The 22-item Urban Life Stress Scale (Jaffee et al., 2005) measured subjective contextual stressors, with “0” no stress at all to “4” extreme stress, to include finances, housing, job situation, transportation, drugs, violence, crime, community conflicts, relationships. Possible scores range from 0 to 48, with higher scores indicating higher stress.

Other covariates assessed at baseline were age, ethnicity/race, marital status, education, employment, income, general health, smoking behaviors (cigarettes per day, brand smoked, previous quit attempts), alcohol and drug use (in the past month; yes/no) and actual height and weight. Participants height and weight were converted to body mass index (BMI) using the standard formula [(weight (kg)/height (m)^2].

Variables assessed at baseline, 6 months and 12 months included smoking cessation self-efficacy, measured by the Smoking Efficacy/Temptation Scale, a 9-item, 5-point Likert type scale (Velicer et al., 1990), with possible scores ranging from 9 to 45. This scale measured smokers' level of temptation to smoke in 9 challenging situations, with lower scores indicating higher self-efficacy. Social support was measured with the 12-item Medical Outcomes Study of Social Support Survey (MOS-SSS) (Sherbourne and Stewart, 1991). This scale measured an individual's perception of the availability of support along four dimensions: (a) emotional/informational; (b) affectionate; (c) tangible; and (d) positive social interaction. Possible scores range from 12 to 60, with higher scores indicating higher social support.

2.5. Analyses

All statistical analyses were conducted using SAS 9.3 (SAS Institute, Cary, NC, 2002–2005) with statistical significance at an alpha level of 0.05. Comparison between groups at baseline used t-tests for continuous variables and chi-square tests for categorical variables. The primary outcome of interest was smoking status, dichotomized as smoker/non-smoker at the 6- and 12-month measurements.

For the longitudinal analyses, random coefficient models were used to account for the group-randomized trial design (Murray et al., 2004). Smoking status, the dependent variable, was analyzed assuming a binomial distribution, using the logit link. For all longitudinal models, the fixed effects included treatment (control vs. intervention), time of measurements (6 and 12 month), and a treatment-by-time interaction. The neighborhood is the unit of analysis, however, individual level data such as smoking outcomes at 6 and 12 months were used in modeling so that covariates at the individual level could be included. The clustering of the individuals within neighborhoods was accounted for using a random effect (random intercept/subject = neighborhood).

Logistic regression models were used to analyze smoking status, the dependent variable, for participants in the intervention group to establish associations with the number of community health worker contacts, group sessions attended, and weeks of nicotine patch use individually.

Univariate analysis was carried out on all variables hypothesized to be potential predictors including demographics (age, income, education), baseline measurements (nicotine dependence score, depression score, BMI, alcohol use, drug use, number of years smoked) and factors previously identified as potential moderators (stress, social influence, household smoker present) or mediating factors (change from baseline to 12 months in self-efficacy, social support, baseline number of cigarettes smoked). Those covariates with p-values < 0.25 in univariate analyses were included individually in multivariable models; due to the small

number of participants who quit smoking, there was insufficient power to test interactions with any of the covariates or to include all covariates in a single model.

3. Results

Approximately 86% of the sample were African American, 34% had not completed high school or equivalency, and 78% reported household incomes less than $20,000/year. At baseline, women, on average, smoked 12.7 cigarettes per day. Table 1 shows the baseline demographics for each group. Of the 409 women recruited, 36 (8.8%) did not complete the study. There were no statistically significant differences in drop-out rates observed between intervention and control groups, (10% and 7.5% respectively) as shown in Fig. 1. Among non-African-American participants, >18% did not complete the study compared to 7% among African-American women ($p = 0.005$).

Our initial analyses revealed smoking abstinence rates of 8% vs. 2.9%, $p = 0.023$ (intervention vs. control) at 6 months and 9% vs. 4.3%, $p = 0.058$ (intervention vs. control) at 12 months as defined by self-report abstinence, CO ≤ 8 ppm and cotinine ≤14 ng/ml. Since there was discrepancy in the data with additional participants who self-reported smoking abstinence and had CO ≤ 8 ppm, yet showed elevated saliva cotinine levels, additional analyses were completed due to concerns of passive tobacco smoke exposure in these multi-unit housing complexes (Wilson et al., 2014; King et al., 2010). To account for participants that live with other smokers which may have caused an increase in cotinine levels, participants were re-evaluated and considered non-smokers if they self-reported quitting, lived with other smokers, had CO ≤ 8 ppm, and had cotinine levels that fell within the range for passive smokers (<49 ng/ml). Using this definition abstinence rates were 10% vs. 3.4%, $p = 0.007$ (intervention vs. control) at 6 months and 12% vs. 5.3%, $p = 0.016$ (intervention vs. control) at 12 months.

Both groups had a reduction in cigarettes from baseline to 12 months, with the intervention group having higher reduction than the control group (12.6 to 6.1 cigs/day vs. 12.8 to 8.2 cigs/day; $p = 0.0016$). In the intervention group, 66% of women made at least one quit attempt and self-reported abstinence on at least one community health worker visit during the 6 month intervention period. Over one-third of women in the intervention group (34%) self-reported abstinence at least 4 or more time points during the first 6 months who did not remain abstinent at 6 or 12 months.

In the multivariate regression analyses, there was no statistically significant effect of the intervention on the odds of being a non-smoker (OR = 0.44, 95% CI: 0.18–1.07) as shown in Table 2. The parameter values resulting from the models were almost identical regardless of cotinine cut-off ≤14 ng/ml or <49 ng/ml (as described above). The results shown in Table 2 reflect cotinine ≤14 ng/ml. Women with lower baseline nicotine dependence scores (OR = 0.84, 95% CI: 0.73–0.95), lower baseline depression scores (OR = 0.94, 95% CI: 0.89–0.99), fewer social smoking influences (OR = 0.90, 95% CI: 0.83–0.96) and improved self-efficacy (OR = 0.90, 95% CI: 0.88–0.93) had significantly better odds of quitting. A treatment by time interaction was not statistically significant and was therefore removed from the model to allow for investigation of the main effect of group (intervention vs.

control) on smoking cessation (Fitzmaurice et al., 2011). Age, education, alcohol use, number of years smoked, presence of another household smoker, and stress were not statistically significantly associated with smoking status. As shown in Fig. 2, the intervention had a statistically significant effect on the change from baseline average number of cigarettes smoked ($p = 0.03$).

For participants in the intervention group, there were 16 planned community health worker visits with each participant during the study period. The mean number of actual visits per participant was 11.2 of 16, or 70% of the planned visits. Of the 6 possible behavioral group sessions, the average number of group sessions attended was 4 of 6 sessions, or 66% of group sessions offered. Sixty-two percent of participants ($n = 133$) used the nicotine patch; for those who used, the average length was 2.8 weeks (range from 0 to 8 weeks). No participants reported using nicotine gum, spray, or inhalers. One participant each reported using buproprion (0.5%) and varenicline (0.5%).

Within the intervention group, the multivariate logistic regression analyses revealed a significant effect for the number of community health worker contacts on the odds of being a nonsmoker, with a one unit increase in coach contacts increasing the odds of being a non-smoker by 23% (OR = 1.23, 95% CI: 1.08–1.48) as shown in Table 3. Similarly, the number of group sessions attended had a significant effect on the odds of being a non-smoker in the intervention group, with a one unit increase in group sessions attended increasing the odds of being a non-smoker by 60% (OR = 1.60, 95% CI: 1.14–2.24) as presented in Table 4. The number of weeks of nicotine patch use showed a significant effect on the odds of being a non-smoker in the intervention group, with a one week increase in weeks of nicotine patch use increasing the odds of being a non-smoker by 20% (OR = 1.20, 95% CI: 1.04–1.39); see Table 5. However, this relationship did not hold when number of coach visits, number of group sessions attended and weeks of nicotine patches used were included jointly in a multi-variable model with only number of coach visits remaining statistically significantly associated with smoking status (OR = 1.2, $p = 0.028$).

4. Discussion

The *Sister to Sister* intervention is the first randomized controlled trial to test the effectiveness of a CBPR developed smoking cessation intervention with African American women in subsidized government housing. In a representative region in the Southeastern US, our results showed that African American women want to quit smoking and will make serious attempts with cessation. Although 12% of intervention participants reported abstinence at 12 months, the majority of participants were challenged to maintain abstinence. Intervention participants who maintained their community health worker visits, attended group sessions, and used the nicotine patches were more likely to remain abstinent.

These results are similar to other biochemically validated cessation outcomes in randomized controlled trials with low-income, urban African Americans. In a study of 20 Midwestern US public housing neighborhoods, intervention participants received five motivational interviewing sessions and nicotine gum, with 7.6% intervention vs. 9.3% control maintaining abstinence at 6 months (Okuyemi et al., 2007). Similarly, Ahluwalia and

colleagues (Ahluwalia et al., 2006) tested the efficacy of nicotine gum and motivational interviewing in low-income African Americans, with 6 month cessation outcomes of 14.2% in the intervention vs. 11% control. In a randomized trial testing the effect of bupropion and health education counseling among African Americans in an urban community based clinic in Kansas, 13% intervention participants remained abstinent at week 26, vs. 10% control in the control condition ($p = 0.23$) (Cox et al., 2012). The current study, however, demonstrated a higher retention rate compared to previous studies, with 91% of participants retained at 12 months in the current study, compared to 70%–75% six-month retention rate in the other similar studies (Okuyemi et al., 2007; Ahluwalia et al., 2006; Cox et al., 2012). These findings support previously reported evidence that a CBPR approach aids in the recruitment and retention of racial and ethnic minority populations (De Las Nueces et al., 2012; Andrews et al., 2012b).

These cessation results do however differ from our CBPR pilot trial in which the biochemically validated 6 months point prevalence outcomes were 39% intervention vs. 11.5% control ($p = 0.008$) (Andrews et al., 2007a). There were two major differences observed in the pilot and the larger, scaled RCT: time in the neighborhood and readiness of neighborhoods. In the pilot RCT, community leaders approached the academic researchers to assist with smoking cessation strategies. The community-initiated request, along with the committed grassroots community leaders and positive history of other health promoting interventions in the pilot neighborhoods signified a level of readiness and commitment to the partnership and products (Andrews et al., 2012c). The process of identifying champions, co-developing materials, testing feasibility, and implementing the pilot study involved a three year period, allowing time to develop relationships, trust, and co-ownership of the products and processes. This differs from the current RCT, in which the materials and methods developed with these two pilot neighborhoods were transferred into the 14 new neighborhoods. Although permission from tenant associations and identified leaders who assisted with the intervention were received, the neighborhoods varied in their level of engagement and readiness to implement the study. Further, in the current study, much less time was spent (2–3 months vs. 12 to 18 months in the pilot study) in each neighborhood meeting residents, obtaining neighborhood assessments, and identifying leaders prior to the intervention start due to the timeline constraints of the sponsored grant. Investigators, community partners, and especially funders, must consider and ultimately support the time and resources necessary for the processes of building relationships, trust, and co-ownership with marginalized groups (De Las Nueces et al., 2012).

There were other differences that occurred in US subsidized housing over the past decade. The RCT was implemented during the heightened recession period (2009–2013), with revised (and stricter) housing policies and work-reform initiatives. More women were working part-time positions (typically as fast food workers, nursing aides, or housekeeping staff) and had erratic work schedules that made scheduling difficult both for group sessions and community health worker contacts. Flexible meeting times were offered in the morning, afternoon, and early evening; however, women's schedules and priorities changed weekly, affecting their ability to fully engage with the resources provided by the *Sister to Sister* intervention.

Although women in the study indicated their desire to quit smoking within six months, smoking abstinence was difficult in these settings with women who were burdened with limited wealth, struggled to make ends meet, and confronted with daily stressors and negative life experiences of discrimination, marginalization, and powerlessness (McEwen, 1998; Pampel et al., 2010). Smoking was a social norm in these neighborhoods, a “way of life” and a coping response to the social and physical environment with approximately one of every two households (48%) having at least one smoker (Andrews et al., 2014b). Over half of all participants (61%) self-reported regular alcohol use and 49% of participants had CES-D scores suggesting clinical depression at baseline. Women were not only navigating fiscal and social complexities in their impoverished residential neighborhoods, but were also impacted from the common sequelae of living in these environments (smoking, alcohol use, drug use, depression), which challenged smoking cessation efforts.

Generalizability of the findings to other smokers may be limited based on study inclusion criteria of women in subsidized housing in two regions in the Southeastern US. Since biochemical validation was completed only at 6 months and 12 months, we were limited in our ability to characterize relapse among participants who established early abstinence. Other notable limitations were a higher proportion of African Americans in the control group and higher drop-out of non-African American women.

5. Conclusions

A CBPR developed study with minority women in subsidized housing shows promise with recruitment and retention in a large randomized controlled trial. While the cessation outcomes are less promising than previous pilot studies conducted by our team, women made serious quit attempts, quit smoking and/or reduced daily smoking rates over the 12-month study period. This landmark study demonstrated the benefits of a CBPR approach to reach, recruit, and engage this highly vulnerable population, however, effectiveness in promoting lifestyle behavior change in environments burdened with poverty and social inequities remain a challenge. Addressing these social determinants of health continue to be a priority in promoting behavior change with these high-risk communities.

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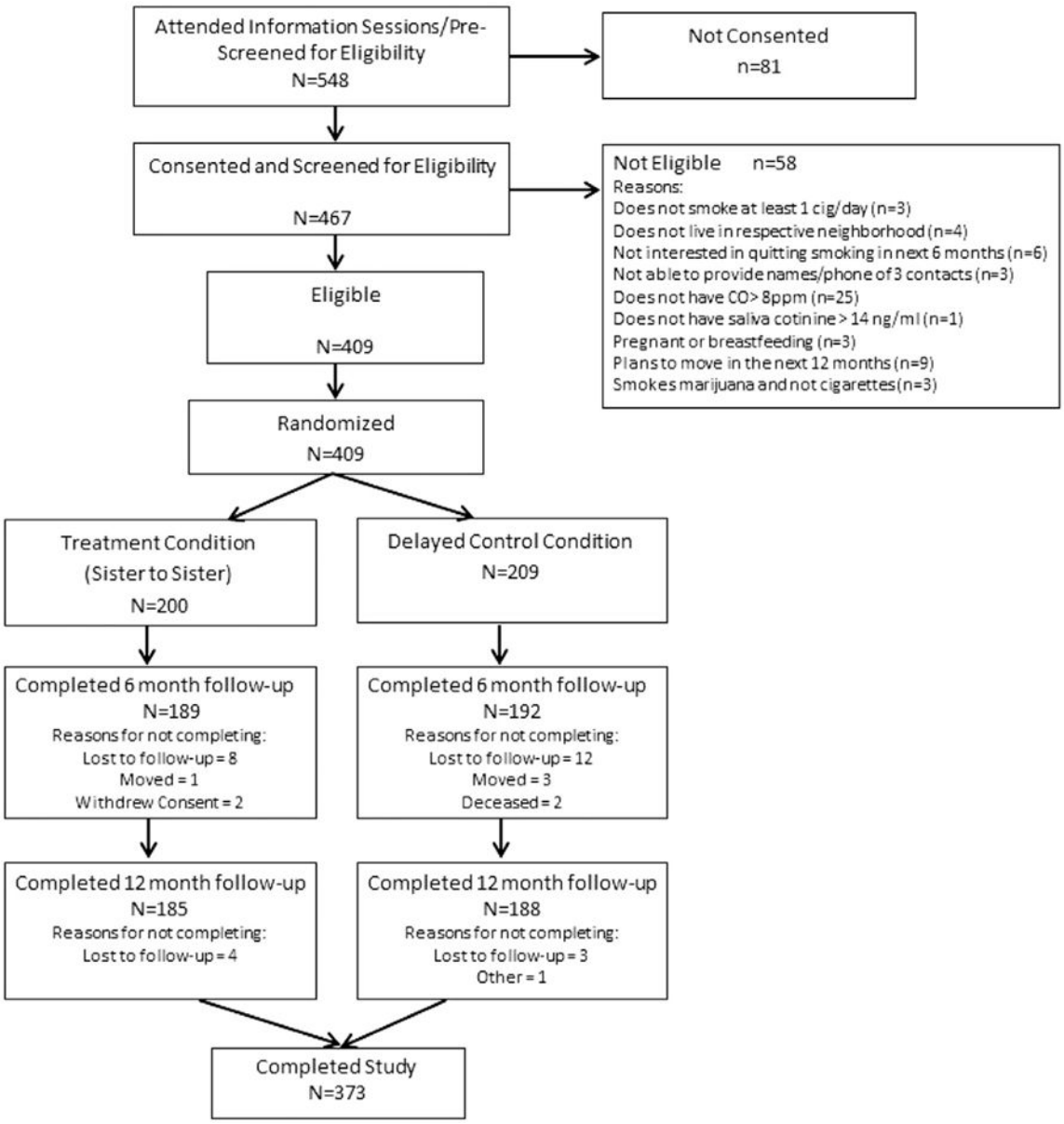

Fig. 1.

Participant flow through the study, Sister to Sister, South Carolina, 2009–2013.

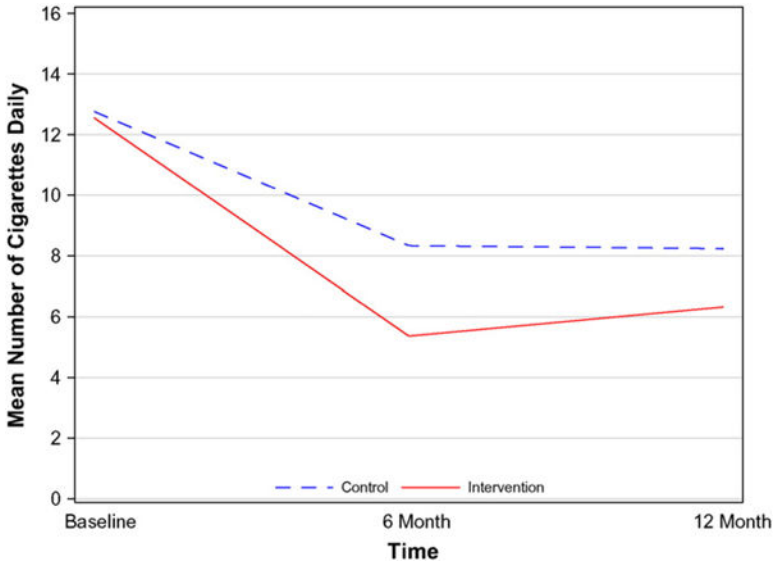

Fig. 2.

Changes in mean cigarettes per day from baseline to 12 months. *Sister to Sister* study, South Carolina, 2009–2013.

Table 1

Baseline demographics, *Sister to Sister*, South Carolina 2009–2013.

Characteristic	Control N = 209	Intervention N = 200	p-Value
Age	43.6 (15.6)	41.1 (14.1)	0.0950
Race			0.0001
Black	192 (91.9%)	157 (78.5%)	
Other	17 (8.1%)	43 (21.5%)	
Education			0.1784
Less than High School	76 (36.4%)	63 (31.5%)	
HS Diploma or GED	111 (53.1%)	104 (52.0%)	
More than High School	22 (10.5%)	33 (16.5%)	
Income			0.3419
$0–$20,000	166 (79.4%)	151 (75.5%)	
$20,001 or more	43 (20.6%)	49 (24.5%)	
Cigarettes per day	12.8 (7.9)	12.6 (7.5)	0.7409
Nicotine dependence score	4.8 (2.2)	4.7 (2.2)	0.5237
Depression score	10.6 (6.3)	10.2 (6.0)	0.5186
BMI	31.5 (8.2)	31.2 (8.8)	0.7151
Perceived stress	28.2 (17.6)	26.8 (16.5)	0.3846
Social influence	8.4 (9.1)	7.7 (7.4)	0.3596
Self-efficacy	31.7 (8.9)	32.0 (8.5)	0.7577
Social support	45.1 (12.8)	46.2 (12.3)	0.3982
Drug use	32 (15.3%)	28 (14.0%)	0.7080
Alcohol use	135 (64.6%)	114 (57.0%)	0.1157

Mean (SD) except where number (percentage) is noted.
Percentages may not sum to 100 due to rounding.

Table 2

Longitudinal Analysis modeling odds to be a non-smoker. (N = 370[a]) including only statistically significant covariates in addition to treatment and time. *Sister to Sister* study, South Carolina, 2009–2013.

	OR	95% CI
Treatment[b]	0.44[d]	(0.18, 1.07)
Time, months[b]		
6 (Ref)	1.0	
12	0.76[d]	(0.41, 1.40)
Nicotine dependence score[c]	0.84**	(0.73, 0.95)
Depression score[c]	0.94*	(0.89, 0.99)
Social smoking influences[c]	0.90**	(0.83, 0.96)
Self-efficacy[c] (change from baseline)	0.90***	(0.88, 0.93)
Number of cigarettes smoked[c] (BL)	0.94**	(0.90, 0.98)

Interaction term time-by-treatment was not significant.

*p-Value < 0.05.

**p-Value < 0.01.

***P-Value < 0.0001.

[a]Reduced sample size due to missing data for temptation/self-efficacy scale at 6 and/or 12 months.

[b]Basic model with treatment, time, treatment-by-time interaction.

[c]Model with treatment, time, and listed covariate.

[d]OR range in models with covariates were (0.45–0.57) for treatment and (0.78–0.95) for time.

Table 3

Analysis modeling odds to be a non-smoker (N = 180[a]) including only statistically significant covariates in addition to number of coach contacts. *Sister to Sister* study, South Carolina, 2009–2013.

	OR	95% CI
Number of coach contacts[b]	1.23[d,**]	(1.08, 1.48)
Depression score[c]	0.91[*]	(0.83, 0.99)
Self-efficacy (change from baseline)[c]	0.94[*]	(0.90, 0.99)

[*] p-Value < 0.05.

[**] p-Value < 0.01.

[a] Reduced sample size due to missing data for temptation/self-efficacy scale at 6 and/or 12 months.

[b] Basic model with number of coach contacts only.

[c] Model with number of coach contacts and listed covariate.

[d] OR range in models with covariates were (1.23) with p-values < 0.01 for coach contacts.

Table 4

Analysis modeling odds to be a non-smoker (N = 180[a]) including only statistically significant covariates in addition to number of group sessions. *Sister to Sister* study, South Carolina, 2009–2013.

	OR	95% CI
Number of group sessions[b]	1.60[d,**]	(1.14, 2.24)
Depression score[c]	0.91[*]	(0.83, 0.99)
Self-efficacy (change from baseline)[c]	0.94[*]	(0.90, 0.99)

[*] p-Value < 0.05.

[**] p-Value < 0.01.

[a] Reduced sample size due to missing data for temptation/self-efficacy scale at 6 and/or 12 months.

[b] Basic model with number of group sessions only.

[c] Model with number of group sessions and listed covariate.

[d] OR range in models with covariates were (1.54–1.63) with p-values < 0.05 for group sessions.

Table 5

Analysis modeling odds to be a non-smoker (N = 180[a]) including only statistically significant covariates in addition to number of weeks on nicotine patch. *Sister to Sister* study, South Carolina, 2009–2013.

	OR	95% CI
Weeks on nicotine patch	1.20*	(1.01, 1.42)
Education		
Less than HS[1] (ref)	1.0	
HS diploma or GED	0.31*	(0.10, 0.98)
More than HS	1.66	(0.50, 5.53)
Depression score	0.87*	(0.79, 0.97)
Self-Efficacy (change from baseline)	0.93*	(0.88, 0.98)

*p-Value < 0.05.

[a]Reduced sample size due to missing data for temptation/self-efficacy scale at 6 and/or 12 months.