

A Community Health Advisor Program to reduce cardiovascular risk among rural African-American women

C. E. Cornell^{1*}, M. A. Littleton², P. G. Greene¹, L. Pulley¹, J. N. Brownstein³, B. K. Sanderson⁴, V. G. Stalker⁵, D. Matson-Koffman³, B. Struempfer⁶ and J. M. Raczynski¹

Abstract

The Uniontown, Alabama Community Health Project trained and facilitated Community Health Advisors (CHAs) in conducting a theory-based intervention designed to reduce the risk for cardiovascular disease (CVD) among rural African-American women. The multi-phased project included formative evaluation and community organization, CHA recruitment and training, community intervention and maintenance. Formative data collected to develop the training, intervention and evaluation methods and materials indicated the need for programs to increase knowledge, skills and resources for changing behaviors that increase the risk of CVD. CHAs worked in partnership with staff to develop, implement, evaluate and maintain strategies to reduce risk for CVD in women and to influence city officials, business owners and community coalitions to facilitate

project activities. Process data documented sustained increases in social capital and community capacity to address health-related issues, as well as improvements in the community's physical infrastructure. This project is unique in that it documents that a comprehensive CHA-based intervention for CVD can facilitate wide-reaching changes in capacity to address health issues in a rural community that include improvements in community infrastructure and are sustained beyond the scope of the originally funded intervention.

Introduction

African-American women are at greater risk for cardiovascular disease (CVD) than White women of comparable socioeconomic status, and they exceed White women in age-adjusted death rates [1–4]. Contributing factors to this disproportionate risk include differences in health-care access [5–7], knowledge of symptoms and risk factors [8, 9] and the presence of various risk factors, including lifestyle behaviors [1, 8–10]. Southern rural African-American women have among the highest rates of CVD mortality, especially for stroke [2], and thus health promotion programs are needed to address the CVD burden of this group.

Use of community-based approaches has long been advocated to address the complex of social determinants that contribute to the substantial health disparities that exist in marginalized communities [11]. Interventions conducted by trained lay people (known as Community Health Advisors (CHAs),

¹Department of Health Behavior and Health Education, Fay W. Boozman College of Public Health, University of Arkansas for Medical Sciences, Little Rock, AR 72205, USA,

²Department of Public Health, College of Public Health, East Tennessee State University, Johnson City, TN 37614, USA,

³Division of Heart Disease and Stroke Prevention, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA 30341-3717, USA,

⁴Division of Cardiovascular Medicine, Department of Medicine, ⁵Department of Health Behavior, School of Public Health, University of Alabama at Birmingham, Birmingham, AL 35205, USA and

⁶Department of Nutrition and Food Science, Auburn University, Auburn, AL 36849, USA

*Correspondence to: C. E. Cornell. E-mail: ccornell@uams.edu

Community Health Workers, *promotores de salud* and other names [12]) working within the context of a community-based approach have recently obtained ‘best practice’ status for reducing health disparities, including disparities in CVD risk, among people living in underserved communities [6, 13]. Among other successes [14], CHA programs have successfully addressed health concerns [15–20] and chronic diseases, including CVD [21, 22], hypertension [13, 23], diabetes [24] and cancer [25–28]. CHAs can facilitate the adoption of health promotion programs by acting as change agents and opinion leaders with shared language, culture and values and extensive knowledge of local resources and health issues [29–33]. One approach, the Community Health Advisor Network (CHAN) model [30, 34], involves recruiting and training a community’s natural helpers (those to whom community members already turn for support and advice) to enhance knowledge and skills required to address their community’s needs.

The Uniontown Community Health Project implemented a theory-based CHA intervention to reduce CVD risk among African-American women living in a rural, southern community. In accordance with the CHAN philosophy, the community was actively engaged in all aspects of the project. This paper describes the formative and process evaluations related to community organization, CHA training, the intervention and the maintenance of project activities, and it illustrates how a CHA-based intervention can increase a community’s potential for addressing health issues and mobilizing environmental changes. Given the dearth of CVD risk reduction programs in geographically isolated, predominantly African-American communities, this approach may be useful to others undertaking such programs in similar areas. Primary outcome measures will be presented elsewhere.

Methods

Theoretical framework

The CHA approach is grounded in Community Empowerment [35] and Diffusion of Innovations

theories [36]. Community Empowerment is ‘a social-action process in which individuals and groups act to gain control and mastery over their lives in the context of changing their social and political environments’ (p. 142) [35]. Diffusion of Innovations describes the process by which innovative ideas or practices (e.g. health promotion programs) are disseminated and adopted within a social system. The extent to which an innovation is adopted can be influenced by opinion leaders and change agents [36]. The CVD risk reduction intervention was guided by Social Cognitive Theory [37, 38], which asserts that behaviors are determined by interactions among personal, behavioral and environmental factors. The major behavioral risk factors for CVD (use of tobacco, unhealthy dietary habits and physical inactivity) are influenced by cultural norms and occur within a social context. Thus, programs that affect risk factor behaviors and environmental supports for heart-healthy behaviors should effect sustainable change in health risk behaviors.

Community and project overview

Uniontown is located in the rural southern portion of Alabama and had a population in 2000 of 1636 (88.2% African-American). Per capita annual income was \$8268, and 48.2% of families lived below the poverty level [39]. In addition to the standard CHAN curriculum [34], which focuses on community-identified issues, resource identification and problem solving, CHAs in the Uniontown Project received health education focused on CVD and skills training in reducing CVD risk. The intervention included health promotion activities to increase women’s awareness of their CVD risk, knowledge of risk factors and strategies to prevent CVD; classes in heart-healthy nutrition, physical activity and tobacco cessation and environmental changes. Although evaluation focused primarily on women, all community residents were invited to participate in the formative and intervention activities to facilitate community adoption of the program and to provide an opportunity for women to include their families. Competing family responsibilities pose a barrier to engaging in physical activity interventions for women, and strategies to address this barrier have

been advocated [40, 41]. This project was approved by the University of Alabama at Birmingham Institutional Review Board.

The four phases of the project

Phase I: formative evaluation, community organization, recruitment of CHAs (October 1995 to October 1996)

Table I describes the Phase I strategies used to gather formative data and to engage community leaders and residents. These included a town meeting, community inventories, focus groups, key informant interviews and CHA identification and recruitment.

During the town meeting, attendees completed a self-administered Community Priorities Survey [42] which used closed and open-ended question formats to identify and prioritize issues residents considered important for their community, their families and themselves. Following the town meeting, community leaders distributed the survey throughout the community.

Focus group moderators' guides included questions on one of five topics: (i) knowledge and attitudes about CVD risk and risk reduction strategies, (ii) dietary habits, (iii) physical activity, (iv) tobacco use and (v) project implementation in the community. Participants for the 15 focus groups (one mixed gender and two gender-specific groups for each of the five topic areas) were recruited through churches, businesses and other organizations. Groups were audiotaped, tapes were transcribed and transcripts were independently reviewed by the project co-ordinator and investigators who used the constant comparative thematic analysis method to identify common and recurring themes [43].

Potential CHAs were identified using a 'snowball process', which involved interviewing natural helpers and asking them to identify other natural helpers who were interviewed in turn, and so on. Identified persons were invited to attend the initial CHA training session.

Phase II: CHA training (November 1996 to September 1997)

Phase II included general training of residents interested in becoming CHAs to address community and

CVD-related issues and specialized training to lead activities designed to reduce CVD risk [44]. General training (November 1996 to April 1997) consisted of 10 2-hour group sessions, five focused on community issues and five on CVD and its risk factors [42]. Twenty-five individuals (21 women, 4 men, all African-American) completed general training.

Specialized trainings (June to September 1997) focused on (i) heart-healthy food preparation, (ii) strategies to foster physical activity and smoking cessation and (iii) cardiopulmonary resuscitation. Six 3-hour group training sessions were conducted for each of these three areas (total = 18 hours of training per area). CHAs who wanted to receive specialized training could elect to receive training in one, two or all three of these content areas. Sessions included didactic instruction and skill practice with feedback. At the end of specialized training, CHA action teams and project staff reviewed potential intervention activities and developed or adapted activities to specifically target the needs and resources of Uniontown residents. Fourteen persons (12 women, 2 men) completed specialized training in physical activity, 17 (all women) completed nutrition training and 7 (6 women, 1 man) completed tobacco cessation training. Two individuals who completed physical activity training became certified aerobics instructors. CHAs were given small incentives for training such as tee shirts and tote bags.

The site facilitator administered a questionnaire describing previous experiences as natural helpers to a subset of CHAs who completed general training. Some CHAs also completed pre- and post-training questionnaires developed by the project team to assess the effects of training on self-efficacy, knowledge and self-reported behaviors related to giving advice and assistance to friends and neighbors and taking leadership roles in addressing community-identified and CVD-relevant issues. Paired *t*-tests were used to compare pre- and post-training responses.

Phase III: intervention (October 1997 to October 1998)

Phase III consisted of a 12-month intervention in which CHAs and project staff conducted

Table I. *Formative research activities conducted and needs and resources identified as a result of Phase I formative evaluation*

Method used	Conducted by	Purpose	Needs and resources identified
Community priorities survey (<i>n</i> = 313; 75% women)	Site facilitator and AmeriCorps volunteers	To identify and prioritize residents' issues considered important to their community, families and themselves.	High-priority community issues related to economic opportunities, safety and health. High-priority family and personal issues related to CVD and its risk factors.
Community inventories	Project staff, site facilitator and AmeriCorps volunteers	To assess availability and costs of heart-healthy/unhealthy foods, opportunities for women to walk and engage in other physical activities and resources for smoking cessation.	Sole local grocery store stocked fewer low-fat/low-cholesterol foods than high-fat/cholesterol items (e.g. shelves containing lard covered 32 square feet). Prices were higher for some available lower fat foods than for higher-fat foods (e.g. non-fat versus whole milk). Local eateries offered no low-fat menu options. There were no resources for learning heart-healthy food preparation. Few neighborhoods had sidewalks; many existing sidewalks were in disrepair. There were no opportunities for adult women to be physically active (e.g. no exercise classes, public pools or indoor locations for walking). The sole outdoor track was in disrepair. No resources were available for tobacco cessation.
Focus groups (total <i>n</i> = 144; mean = 9.6 per group; 71% women)	Tuskegee University consultants	To inform intervention and evaluation instrument development and to assist in identifying project resources.	Few knew how to prepare heart-healthy foods that families would eat. Many were confused about which foods contained cholesterol and saturated fat. Some said they could not exercise because they had high blood pressure. Knowledge about some risk factors (e.g. need to consume less cholesterol) was relatively high, while knowledge of other risk factors was low (e.g. diabetes, sedentary lifestyle). Overall, women did not perceive themselves at high risk for CVD.

Table I. *Continued*

Method used	Conducted by	Purpose	Needs and resources identified
Key informant interviews with community gatekeepers	Project staff	To obtain assistance in navigating the community's political, business and social structures and in finding potential community facilitators, steering committee members, CHAs and physical resources for project activities.	Full-time, paid site facilitator identified and hired to oversee project. Three AmeriCorps Volunteers in Service to America recruited to assist facilitator. Uniontown CHC was formed to serve as a steering committee. City leaders identified space for project office, training sessions and physical activity and nutrition classes. Community leaders provided ongoing assistance by broadcasting project events and classes on local cable television station, providing space for town meetings and health fairs, partnering with CHAs to make environmental changes and keeping the city council informed about the project.

community-wide educational events and classes in nutrition, physical activity and smoking cessation. Following Social Cognitive Theory and formative data obtained in Phase I, the intervention was designed to (i) increase community awareness of the program, (ii) increase knowledge about CVD symptoms, risk factors, risk reduction strategies and actions to be taken during a heart attack or stroke, (iii) promote adherence to screening and recommended medical regimens for CVD risk factors, (iv) increase readiness to change and (v) provide classes and other resources for those ready to make behavioral changes.

CHAs were unpaid volunteers, and as such made their own decisions about what activities to undertake and what roles to play in those activities. CHAs who wished to lead intervention activities were given everything needed for those activities (e.g. full sets of cookware and kitchen tools, athletic wear, etc.). Additional intervention costs (e.g. boom boxes, CDs, exercise equipment, food costs) were also covered by the project. CHA leaders initially co-conducted activities with project staff, then assumed full responsibility for facilitating

intervention events and classes. Process evaluation included tracking of participation at events, use of risk reduction resources and additional activities conducted by individual CHAs.

Phase IV: maintenance (October 1998 to October 2000)

Following the 12-month intervention, the project transitioned into a maintenance phase in which CHAs decided which activities to continue and then modified those activities as desired. Project staff served as consultants and collected process data in collaboration with the CHAs. Process measures tracked maintenance of activities and changes in community capacity for addressing health and related issues.

Results

Phase I

As detailed in Table I, Phase I activities identified high-priority issues as well as needs and resources for training and intervention.

Community inventories revealed multiple needs for community resources to support changes in risk behaviors. This lack of local resources posed a significant barrier because Uniontown is ~20 miles from any larger town over isolated roads and many residents lack reliable transportation. Focus group data indicated that many residents knew generally what to do (e.g. consume less cholesterol, salt and fat), but not how to lower their CVD risk; confirming that training and intervention activities needed to include a focus on increasing risk reduction knowledge and awareness.

Key informant interviews identified personnel and space required for the project and garnered support from influential community leaders. The mayor agreed to serve as principal investigator for the project's subcontract, members of the city council completed CHA training and city leaders agreed to serve on and recruit others for the Uniontown Community Health Council (CHC), a coalition of community leaders that was formed to serve as a project steering committee. Key informants also continued to provide personal assistance throughout the project. For example, city leaders volunteered time and personal resources to supplement grant funding for renovations needed to accommodate intervention activities.

The Phase I CHA identification process recruited 33 persons to the initial CHA meeting in which ground rules for the training process were jointly developed by attendees and staff and topics for the general training sessions were finalized based on issues identified in the Community Priorities Survey. Resulting topics addressed crime, unemployment, neighborhood cleanup, sexually transmitted diseases, drug and alcohol abuse, heart disease and stroke, stress and high blood pressure, tobacco use, nutrition and physical activity [42].

Phase II

The 19 CHAs who completed the CHA profile reported a variety of previous experiences as natural helpers (Table II), including 19 community and 15 church leadership positions. CHAs thought that people turned to them for help because they were trusted and good listeners and because they gave good advice. Demographic data from the profile showed that these CHAs had lived in Uniontown for an average of 25 years (range = 5–51) and had a mean household size of 3.6 people (range = 2–9). Table III summarizes other profile demographics in comparison with the overall Uniontown community.

CHAs completing both pre- and post-training questionnaires ($n = 10$) demonstrated increases in

Table II. *Profiled CHAs' previous roles as natural helpers (n = 19)*

Previous community projects	Who comes to you for advice?	Where do you give advice?	With what are you asked for help?	How do you give help?
Neighborhood cleanup	Friends	Over the phone	Health	Give information
Crime prevention	Family	In my home	Family problems	Listen
Elder care	Neighbors	At work	Using health services	Give direct help
Reducing teen pregnancy	Church members	At someone else's home	Using welfare services	Refer to services
Reducing high school dropout	Coworkers	At meetings	Transportation	Recommend medicines
Unemployment	Acquaintances		Recreation	Recommend remedies
Walkathon				Call someone
Fund-raisers				
Blood pressure screening				
Youth enrichment program				
Blood drive				
Cancer prevention				
Red Cross volunteer				

knowledge about reducing CVD risk ($t = -2.43$, $P < 0.05$), and in self-efficacy ($t = -5.00$, $P < 0.001$) and behaviors ($t = -3.19$, $P < 0.01$) related to giving advice and assistance about risk reduction strategies to others. Pretraining self-efficacy, beliefs and behaviors related to general community issues were already high and pre- to post-training changes were not significant for those measures ($P > 0.05$).

Phase III

Community-wide health promotion events and services

As a group, CHAs facilitated and monitored use of the outdoor track (total $n = 35$ regular walkers; mean = 15 per day) and hosted two community health fairs (total $n = 261$); two fun walks (total

$n = 61$); a low-fat food fair ($n = 114$); two smoke-free days (total $n = 20$ pledges to quit); ongoing blood pressure checks in the project office (total $n = 80$; mean = 3 per day) and a clinic program to obtain free nicotine patches for smokers trying to quit. In addition, CHAs independently initiated low-fat church dinners, neighborhood walking groups, nutrition and exercise activities for senior citizens, anti-smoking skits in local schools and informal information sharing.

Environmental changes

CHAs and project staff worked with city officials to repair lights and clean up the outdoor track for walking; install new appliances for nutrition activities; renovate the facility for physical activity classes and establish a health and wellness section in the city's library. CHAs also persuaded the local 'dollar store' to stock items required for heart-healthy cooking, including non-stick cooking sprays and skillets, kitchen shears and spices. To address the community goal of making the downtown area more attractive, CHAs organized neighborhood beautification projects to clean up trash and plant trees and flowers, which also provided lifestyle exercise to participating residents. As the project progressed, CHAs compiled a resource directory that listed local venues and partners for project activities and provided contact information for subsequent community projects.

Risk reduction classes

Physical activity

During the intervention phase, CHAs with physical activity training led a total of 108 aerobics classes (two to three classes per week), which were attended by a total of 107 persons (97% women), 74.7% of whom attended four or more classes per month. Mean intervention year attendance was 17.75 persons per class.

Nutrition

CHAs with nutrition training hosted monthly 'cooking clubs' in their homes or other convenient locations. Club members altered favorite recipes to

Table III. Demographic characteristics of CHAs who completed a profile^{ab} compared with the Uniontown community^c

	CHA, <i>n</i>	CHA, %	Uniontown, %
Sex (<i>n</i> = 19)			
Female	16	84.2	57.8
Male	3	15.8	42.2
Race: African-American	19	100	88.2
Age 40+ years (<i>n</i> = 18)	9	50.0	Age 35+ years = 41.3%
Highest grade completed (<i>n</i> = 19)			
Middle school	2	10.5	27.2
High school	6	31.6	23.5
Some college	6	31.6	^d
Technical school	5	26.3	^d
Marital status (<i>n</i> = 16)			
Currently married	5	31.3	31.6
Household income, \$ (<i>n</i> = 17)			
0–9999	9	52.9	41.5
10 000–19 999	4	23.5	^d
20 000–29 999	3	17.7	^d
30 000–39 999	1	5.9	^d

^aNot all CHAs completed every question of the profile.

^bOccupations of CHAs included home health attendant, machine operator, writer/photographer, teacher, outreach worker, bus driver, recreation director, AmeriCorp Volunteers in Service to America volunteer, telecommunications operator, nursing home worker, student, homemaker, cashier and nun.

^cU.S. Bureau of the Census. Census 2000.

^dNot available in this form in census database.

taste good while containing less fat and salt. The cooking clubs were attended by a total of 76 community residents (75% women), most of whom were regular attendees (mean attendance = 10.14 persons per club).

CHAs used the successful cooking club recipes for monthly community dinners held in the town's recreation center. While residents dined, CHAs distributed recipes and demonstrated techniques used in recipe preparation. Attendees completed taste ratings for each dish and indicated whether they would serve that dish to their families. The highest rated recipes were compiled in a cookbook which CHAs distributed throughout their county and beyond. During the intervention phase, a total of 137 residents (66% women) attended the community dinners, with most attending multiple dinners (mean = 64.5 residents per dinner).

Tobacco cessation

CHAs trained in smoking cessation held two multi-session stop-smoking classes, which were attended by a total of six people. The low attendance motivated CHAs and staff to redirect their efforts toward increasing community awareness about the health risks of smoking and exposure to secondhand smoke and providing one-on-one information and advice about cessation.

Phase IV

During the maintenance phase, CHAs continued to host CVD risk reduction activities, formed new coalitions and partnered to obtain funding for additional research and service projects. CHAs independently retained all activities begun during the intervention phase except the cooking clubs and even trained a new aerobics leader themselves. Attendance at the community dinners decreased from that observed during the intervention phase (mean maintenance attendance = 41.63 persons per dinner), but aerobics class attendance increased (mean = 26.75 persons per class) due in part to completion of the physical activity room renovations, which included the installation of air conditioning. Community groups also began using the

renovated areas for new events, including after-school karate and African dance classes for youth.

CHAs, CHC members and project staff partnered to seek funding for sustaining and expanding the CVD risk reduction activities. CHAs obtained small donations from local businesses and accepted contributions from participants who wanted to give something. In addition, substantial funding was obtained by the Alabama Department of Public Health and the Alabama Cooperative Extension Service that subsidized the ongoing events and classes and funded new activities built on the infrastructure (trained CHAs, an experienced coordinator and active community coalitions) created by the present project (Table IV).

The community's enthusiasm and interest in addressing other health issues has attracted funding for seven new research and service programs that have provided additional support for CHAs and for the project office and other facilities. Three of these programs included investigators from the present project; investigators for the other programs were new to the community. CHAs and CHC members also formed new coalitions who worked with existing and new partners to address community-identified needs. Among other successes, coalition partners obtained funding for economic development and attracted a new industry, which created more than 70 jobs. Ms Stalker continues to work with the Uniontown CHAs on a large dental health project, which is headquartered in the original Uniontown Project office and focuses on children and adults throughout the community. The renovated facilities are still being used by the city, but CVD risk reduction activities are not currently being held there.

Discussion

The Uniontown Project is unique in that it integrated training in CVD risk reduction with the traditional CHA focus on general community issues, and it combined the grassroots CHA model with the CHC, a coalition of local leaders. Although previous studies have used lay helper models to address other health issues in rural women [30, 31] and to address single and multiple CVD risk factors in

Table IV. *New projects that maintained and expanded activities to reduce the risk of CVD*

Project name	Funding partner/sponsor	Project description
Core capacity CVD project (funded in approximately 1999)	Alabama Department of Public Health/CDC	Implemented environmental and policy interventions to reduce CVD risk, including initiation of a Uniontown farmer's market. CHAs helped to organize and advertise the market and assisted in collecting data to track the market's success. Provided signs and other marketing materials for many existing activities for reducing CVD risk, including community classes.
Nutrition education program (funded in approximately 1998)	Alabama Cooperative Extension Service/US Department of Agriculture	Hired one of the nutrition-trained CHAs to conduct nutrition education throughout the county. Funded a variety of activities in nutrition education, including those in Uniontown.
Church-based African-American diabetes program (funded in approximately 2000)	University of Alabama at Birmingham and Alabama Department of Public Health/CDC	Provided diabetes education through community churches. Topics included general diabetes management and related information, such as diabetes as a risk factor for CVD, the role of obesity and the importance of healthy habits in nutrition and physical activity.

urban African-American populations [13, 21–24, 45], no other published studies have reported on a program targeting multiple CVD risk factors in rural African-American women, and none has documented wide-reaching changes in community capacity to address health issues beyond the scope of the original project. This is also the first documentation that CHAs working in the context of a chronic disease intervention project can lead efforts to improve a community's physical infrastructure. Examples in Uniontown include renovated facilities for physical activity, town beautification and farmers markets.

Taken together, the project partners' ability to obtain resources to sustain and expand efforts to reduce CVD risk; attract new research and service projects to address additional health issues and develop new coalitions, partnerships and funding for community-identified needs provides substantial evidence for increased community capacity to address health-related issues [46, 47]. At the outset of the project, Uniontown possessed assets on many dimensions of community capacity [48], including

leadership and access to power, rich community support networks, a strong sense of community and an understanding of community history. The Uniontown Project facilitated increases in additional dimensions of capacity including expanding citizen participation, enhancing residents' skills, expanding community resources and promoting new partnerships within the community as well as with new external partners.

This project may be viewed as a successful community empowerment program that encourages residents to educate themselves, define their own problems, set their own priorities, develop their own programs and, as necessary, engage the power structure to remove barriers or provide assistance [49–53]. In Phase 1, project staff supported community empowerment [54, 55] by addressing community priorities; working to gain trust and build relationships; engaging residents in formative work and identifying, training and mentoring grassroots community change agents. Phase I activities also initiated the community mobilization process, as many residents who took part in the formative

evaluation continued to be involved in risk reduction efforts as leaders or participants. In Phases II and III, the community mobilized to work toward common goals as demonstrated by participation in CHA training, risk reduction classes and community-wide events. During Phases III and IV, CHAs took leadership roles in planning and implementing the intervention and maintaining risk reduction activities, growing new coalitions and service programs and attracting new research.

Residents used infrastructure developed by the CVD project to address additional priorities, an infrastructure that consisted of new social capital in the form of coalitions and informal working groups as well as added physical resources. The continuing employment and volunteer work of the CHAs and other residents made possible through new research and service programs, and the ongoing use of the project's physical facilities provide evidence that this infrastructure continues to be a health resource for the community.

Study limitations

This study included only one intervention community with strong advocates in city government and a core of citizens ready to work for community change. The results obtained here may not generalize to communities with lower levels of existing community capacity. Although outcome surveys were conducted in a matched control community, process data were not collected in that community. Nevertheless, anecdotal information from partners in the comparison community indicates that similar activities and initiatives have not occurred there.

The project team failed to make aggressive efforts to obtain data from CHAs who were absent when training questionnaires were administered. A greater emphasis in the training sessions on the importance of obtaining complete assessment data and more substantial efforts (e.g. providing incentives for completing questionnaires) to obtain complete data from CHAs who were absent at the time of initial questionnaire administration would likely have decreased the volume of missing training data.

Practice implications

The Uniontown Project demonstrates that a partnership between academic researchers, community-based organizations and lay community leaders can facilitate creative approaches based on robust theories of health promotion for engaging members of underserved populations to implement a CVD risk reduction program. Such a program can catalyze community change and increase capacity to address health-related issues. While this study provides a model for mobilizing communities with minimal economic and health-care resources, additional research is needed to identify community characteristics needed for adoption and maintenance of risk-reducing strategies. Future research should explore the effectiveness of this model in rural communities with lower levels of initial community capacity and resident support.

Funding

National Heart, Lung, and Blood Institute; National Institutes of Health and Centers for Disease Control and Prevention (U48/CCU409679 to J.M.R.).

Acknowledgements

Special thanks to Dr Francis Taylor and other faculty from the Department of Social Work, Tuskegee University, for conducting the focus groups and to Martha Cole, Sharhonda Love and Venus Smith for assistance in preparation of the manuscript. The findings of this paper are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

Conflict of interest statement

None declared.

References

1. American Heart Association. *Heart Disease and Stroke Statistics: 2008 Update At-A-Glance*. Dallas, TX: American Heart Association, 2008. Available at: <http://www.americanheart.org>. Accessed: 8 October 2008.

2. Casper ML, Barnett E, Williams GI, Jr *et al.* (eds). *Atlas of Stroke Mortality: Racial, Ethnic, and Geographic Disparities in the United States*. Available at: http://www.cdc.gov/dhdsp/library/cvd_atlas.htm. Accessed: 20 October 2008.
3. Casper ML, Barnett E, Halverson JA *et al.* (eds). *Women and Heart Disease: An Atlas of Racial and Ethnic Disparities in Mortality*. Available at: http://www.cdc.gov/dhdsp/library/cvd_atlas.htm. Accessed: 8 October 2008.
4. Hayes DK, Denny CH, Keenan NL *et al.* Racial/ethnic and socioeconomic disparities in multiple risk factors for heart disease and stroke in women: behavioral risk factor surveillance system, 2003. *J Womens Health (Larchmt)* 2006; **15**: 1000–8.
5. Agency for Healthcare Research and Quality. *National Healthcare Disparities Report*. Rockville, MD: U.S. Department of Health and Human Services, 2003.
6. Smedley BD, Stith AY, Nelson AR (eds). *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, DC: Institute of Medicine, National Academies Press, 2003.
7. H.J. Kaiser Foundation. *Key Facts: Race, Ethnicity & Medical Care, 2007 Update*. Available at: <http://www.kff.org/minorityhealth/6069.cfm>. Accessed: 20 October 2008.
8. Folsom AR, Sprafka JM, Luepker RV *et al.* Beliefs among black and white adults about causes and prevention of cardiovascular disease: the Minnesota Heart Survey. *Am J Prev Med* 1988; **4**: 121–7.
9. Kumanyika S, Savage DD, Ramirez AG *et al.* Beliefs about high blood pressure prevention in a survey of blacks and Hispanics. *Am J Prev Med* 1989; **5**: 21–6.
10. Bolen JC, Rhodes L, Powell-Griner EE *et al.* State-specific prevalence of selected health behaviors, by race and ethnicity—Behavioral Risk Factor Surveillance System, 1997. *MMWR Surveill Summ* 2000; **49**: 1–60.
11. Cornwall A, Jewkes R. What is participatory research? *Soc Sci Med* 1995; **41**: 1667–76.
12. Rosenthal EL, Wiggins N, Brownstein JN *et al.* *The Final Report of the National Community Health Advisor Study: Weaving the Future*. Tucson, AZ: University of Arizona Health Sciences Center, 1998, 1–2.
13. Brownstein JN, Bone LR, Dennison CR *et al.* Community health workers as interventionists in the prevention and control of heart disease and stroke. *Am J Prev Med* 2005; **29**(5 Suppl. 1):128–33.
14. Wilson K, Brownstein JN, Blanton C. Community health advisor use: insights from a national survey. In: *Community Health Advisors/Community Health Workers: Selected Annotations and Programs in the United States* Vol. III. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, 1998, ix–xvii.
15. Bezler M, Lingafelter T. Neighbor helping neighbor for healthcare. In: Troxel J, (ed.). *Government Works: Profiles of People Making a Difference*. Alexandria, VA: River Press, 1995, 389–406.
16. Witmer A, Seifer SD, Finocchio L *et al.* Community health workers: integral members of the health care work force. *Am J Public Health* 1995; **85**: 1055–8.
17. Love MB, Gardner K, Legion V. Community health workers: who they are and what they do. *Health Educ Behav* 1997; **24**: 510–22.
18. Brownstein JN, Rosenthal EL. The challenge of evaluating CHA services. In: Rosenthal EL, Wiggins N, Brownstein JN *et al.* (eds). *The Final Report of the National Community Health Advisor Study: Weaving the Future*. Tucson, AZ: University of Arizona, 1998, 50–74.
19. Wiggins N, Borbon A. Core roles and competencies of community health advisors. In: Rosenthal EL, Wiggins N, Brownstein JN *et al.* (eds). *The Final Report of the National Community Health Advisor Study: Weaving the Future*. Tucson, AZ: University of Arizona, 1998, 15–49.
20. Zuvekas A, Nolan L, Tumaylle C *et al.* Impact of community health workers on access, use of services, and patient knowledge and behavior. *J Ambul Care Manage* 1999; **22**: 33–44.
21. Yanek LR, Becker DM, Moy TF *et al.* Project Joy: faith based cardiovascular health promotion for African American women. *Public Health Rep* 2001; **116**(Suppl. 1):68–81.
22. Becker DM, Yanek LR, Johnson WR, Jr *et al.* Impact of a community-based multiple risk factor intervention on cardiovascular risk in black families with a history of premature coronary disease. *Circulation* 2005; **111**: 1298–304.
23. Brownstein JN, Chowdhury FM, Norris SL *et al.* Effectiveness of community health workers in the care of persons with hypertension. *Am J Prev Med* 2007; **32**: 435–47.
24. Norris SL, Chowdhury FM, Van Le K *et al.* Effectiveness of community health workers in the care of persons with diabetes. *Diabet Med* 2006; **23**: 544–56.
25. Brandeis University. *Evidence-based Recommendations: Cancer Prevention and Treatment Demonstrations for Ethnic and Racial Minorities, 2003*. Available at: http://www.cms.hhs.gov/DemoProjectsEvalRpts/downloads/CPTD_Brandeis_Report.pdf. Accessed: 8 October 2008.
26. Wagner TH, Engelstad LP, McPhee SJ *et al.* The costs of an outreach intervention for low-income women with abnormal Pap smears. *Prev Chronic Dis* 2007; **4**: A11.
27. Sung JF, Blumenthal DS, Coates RJ *et al.* Effect of a cancer screening intervention conducted by lay health workers among inner-city women. *Am J Prev Med* 1997; **13**: 51–7.
28. Earp JA, Viadro CI, Vincus AA *et al.* Lay health advisors: a strategy for getting the word out about breast cancer. *Health Educ Behav* 1997; **24**: 432–51.
29. Eng E, Young W. Lay health advisors as community change agents. *Fam Community Health* 1992; **15**: 24–40.
30. Eng E, Parker E. Measuring community competence in the Mississippi Delta: the interface between program evaluation and empowerment. *Health Educ Q* 1994; **21**: 199–220.
31. Eng E, Hatch JW. Networking between agencies and black churches: the lay health advisor model. *Prev Hum Serv* 1991; **10**: 123–46.
32. Burkey S. *People First: A Guide to Self-reliant, Participatory Rural Development*. London: Zeb Books, 1993.
33. The Center for Policy Alternatives, Civic Health Institute at Codman Square Health Center. *Community Health Workers: A Leadership Brief on Preventive Health Programs*. Washington, DC: The Harrison Institute for Public Law at Georgetown University Law Center, 1998, 1–28.
34. University of Southern Mississippi, Center for Sustainable Health Outreach. *The Community Health Advisor Network Program Curriculum*. Hattiesburg, MS: University of Southern Mississippi, 2000.

35. Wallerstein N, Bernstein E. Introduction to community empowerment, participatory education, and health. *Health Educ Q* 1994; **21**: 141–8.
36. Rogers EM. *Diffusion of Innovations*, 3rd edn. New York: Free Press, 1983.
37. Bandura A. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice-Hall, 1986.
38. Bandura A. *Self-efficacy: The Exercise of Control*. New York: WH Freeman, 1997.
39. U.S. Bureau of the Census. Table DP-1. Profile of General Demographic Characteristics: 2000. In: *Census 2000. Demographic Profiles*. Available at: <http://censtats.census.gov/data/AL/1600177904.pdf>. Accessed 18 November 2008.
40. Eyler AA, Vest JR, Sanderson B *et al*. Environmental, policy, and cultural factors related to physical activity in a diverse sample of women: the Women's Cardiovascular Health Network project—introduction and methodology. *Women Health* 2002; **36**: 1–15.
41. Eyler AA, Vest JR, Sanderson B *et al*. Environmental, policy, and cultural factors related to physical activity in a diverse sample of women: the Women's Cardiovascular Health Network project—summary and discussion. *Women Health* 2002; **36**: 121–32.
42. Littleton MA, Cornell CE, Dignan M *et al*. Lessons learned from the Uniontown Community Health Project. *Am J Health Behav* 2002; **26**: 34–42.
43. Strauss A, Corbin J. *Basis of Qualitative Research: Grounded Theory, Procedures, and Techniques*. Newbury Park, CA: Sage Publications, 1990.
44. University of Alabama at Birmingham Center for Health Promotion. *The Flying Sparks Toolkit: CHW Training Manual, CHW Nutrition Manual, CHW Physical Activity Manual, and CHW Smoking Cessation Manual*. Health Communications Unit, Center for the Study of Community Health, University of Alabama at Birmingham, 2007.
45. Hill MN, Becker DM. Roles of nurses and health workers in cardiovascular health promotion. *Am J Med Sci* 1995; **310**(Suppl. 1):S123–6.
46. Raczynski JM, Cornell CE, Stalker V *et al*. Developing community capacity and improving health in African American communities. *Am J Med Sci* 2001; **322**: 294–300.
47. Raczynski JM, Cornell CE, Stalker V *et al*. A multi-project systems approach to developing community trust and building capacity. *J Public Health Manag Pract* 2001; **7**: 10–20.
48. Goodman RM, Speers MA, Mcleroy K *et al*. Identifying and defining the dimensions of community capacity to provide a basis for measurement. *Health Educ Behav* 1998; **25**: 258–78.
49. Shor I, Freire P. *A Pedagogy for Liberation: Dialogues on Transforming Education*. Westport, CT: Bergin & Garvey, 1987.
50. Freire P. *Pedagogy of the Oppressed*. New York: Seabury, 1970.
51. Wallerstein N, Bernstein E. Empowerment education: Freire's ideas adapted to health education. *Health Educ Q* 1988; **15**: 379–94.
52. Braithwaite RL, Lythcott N. Community empowerment as a strategy for health promotion for black and other minority populations. *J Am Med Assoc* 1989; **261**: 282–3.
53. Wallerstein N. Empowerment to reduce health disparities. *Scand J Public Health* 2002; **30**: 72–7.
54. Fawcett SB, Paine-Andrews A, Francisco VT *et al*. Using empowerment theory in collaborative partnerships for community health and development. *Am J Community Psychol* 1995; **23**: 677–97.
55. Laverack G, Wallerstein N. Measuring community empowerment: a fresh look at organizational domains. *Health Promot Int* 2001; **16**: 179–85.

Received on March 20, 2008; accepted on September 29, 2008