Qualitative Research

Assessment of the Building Collaborative Research Capacity Model: Bridging the community-academic researcher divide

Tabia Henry Akintobi, PhD, MPH[1], Donoria Evans Wilkerson, PhD, MPH[2], Kirsten Rodgers, PhD, MPH[3], Cam Escoffery, PhD, MPH, CHES[4], Regine Haardörfer, PhD[4], and Michelle Kegler, DrPH, MPH[4]

[1]Morehouse School of Medicine, Atlanta, GA; [2]ICF International, Atlanta, GA; [3]Georgia College and State University, Milledgeville, GA; [4]Emory University Rollins School of Public Health, Atlanta, GA

Corresponding Author: Tabia Henry Akintobi • 720 Westview Drive, Atlanta, GA 30315 • 404-752-1144 • takintobi@msm.edu

ABSTRACT

Background: Community–based Participatory Research (CBPR) can be challenging when community leaders and academic researchers have not previously co-led research or worked together with established rules guiding their relationships, roles, and respective functions. The objective of this investigation was to assess the processes and outcomes of the Building Collaborative Research Capacity Grant Program, sponsored by the Community Engagement Research Program of The Atlanta Clinical and Translational Science Institute and designed to foster CBPR.

Methods: Four competitively selected community-based organizations (CBOs) participated in capacity-building workshops designed to build research skills and receive technical assistance to plan a pilot study with academic researchers. Pre- and post-surveys were used to assess the impact of the training and technical assistance on the CBOs' knowledge and skills and abilities to plan, implement, and evaluate research. Key informant interviews were conducted with academic researchers and CBO dyads to identify experiences, perceptions, and recommendations related to the program model, and seven identified domains of collaborative research including research skills, attitudes toward collaboration, shared goals, institutional factors, mutual respect, human and fiscal resources, and partnering skills.

Results: Areas of research competency increased from pre- to post-survey, with statistically significant increases in Community Assessment (p= 0.046) and Program Planning (p= 0.046). Each partnership had inherent characteristics related to strengths and barriers affecting the research outcomes.

Conclusions: The present results contribute to the literature through assessment of processes, outcomes, and partner insights of a model designed to facilitate collaborative community-engaged research partnerships. Future research should examine the model to expand understanding of the dimensions of effective community and academic research collaboration.

Key words: community-based participatory research, translational research, research capacity building and technical assistance, community health

https://doi.org/10.21633/jgpha.6.213

INTRODUCTION

Community-based Participatory Research and Its Advantages

Community-based participatory research (CBPR) emphasizes community-academic partnerships and shared leadership in the planning, implementation, evaluation, and dissemination of initiatives. Among the advantages of CBPR are strengthened neighborhood-campus relationships, improved relevance of research questions, enhanced research recruitment, effective implementation, collective dissemination, and mutual benefit for a diverse group of stakeholders (Jagosh et al., 2012; Cargo & Mercer, 2008; Israel, Schulz, Parker & Becker, 1998; Israel, Eng, Schulz & Parker, 2005; Macaulay et al., 1998; O'Fallon & Dearry, 2002; Seifer & Sisco, 2006). A tenet of CBPR is that researchers who want to conduct effective public health research must invest time and resources in building partnerships with community-based organizations (CBOs) and/or neighborhood residents who are gatekeepers to establishing and maintaining community buy-in, ownership, and sustainability. Ideally, community residents are equal or senior partners throughout the research process (Blumenthal, 2006).

Initiatives Designed to Improve CBPR

With translational and participatory models becoming essential to the national prevention research agenda, building of research capacity has been utilized to address power differentials between CBOs and researchers in CBPR. According to Wallerstein, building of research capacity is linked to health outcomes, in that skill development

increases confidence and empowerment, which, in turn, generates community-owned health interventions that are more effective in improving health (Wallerstein & Duran, 2006). Partnership strategies for development of CBPR capacity have been evaluated through approaches ranging from qualitative stakeholder reflections to more rigorous, longitudinal designs. Tendulkar and colleagues assessed a seed-grant program to facilitate community-campus partnerships in clinical research by soliciting CBO and advisory board feedback following each funding cycle to identify lessons learned (Tendulkar et al., 2011). Thompson et al. evaluated a small mini-grant program addressing cancer disparities through key informant interviews to assess perspectives of a community advisory board on the program with a focus on facilitators of sustainability (Thompson, Ondelacy, Godina & Coronado, 2010). Flaman et al. measured chronic disease prevention capacities of community-based capacity building workshops at pre-, post-, and six-month follow-up (Flaman, Nykiforuk, Plotnikoff & Raine, 2010). Semi-structured interviews were then conducted to identify facilitators and barriers to the participants' ability to practice what they learned. Finally, a capacity-building model of Allen et al. expanded evaluation strategies through use of mixed-method assessments (interviews, process notes, and surveys) on a program coupling CBOs to researchers to assess partnership perspectives and to track the success of collaborative grant submissions (Allen, Culhane-Pera, Pergament & Call, 2011).

Evaluations of CBPR and Limitations

Evaluations of CBPR have yielded mixed results, partly because methodologies have not captured the complexity of programs or mechanisms of change. Jagosh et al. identified contextual determinants of CBPR success that include the ability to navigate conflict, negotiate, and build consensus collaboratively (Jagosh et al., 2012). Among the results of successful partnerships are culturally and contextually tailored research, enhanced participant recruitment, and project sustainability. A meta-analysis of CBPR initiatives utilizing 46 instruments identified empowerment and community capacity measures among primary CBPR outcomes (Sandoval et al., 2012).

The studies cited above represent the limited evolution of community and research partnership models that are rigorously assessed and demonstrate the need for in-depth evaluation of initiatives designed to foster CBPR and to assess scholarly outcomes of partnerships. The purpose of the present study was to describe assessment strategies and outcomes designed to evaluate the Building Collaborative Research Capacity Model (BCRCM) of the Community Engagement Research Program guided by the Atlanta Clinical and Translational Science Institute. The Building Collaborative Research Capacity Grant Program was designed to build CBO research capacities, facilitate CBO-academic research partnerships, and fund CBPR pilot projects designed to position partners to be competitive in application for larger grants. **Figure 1** describes the BCRCM (Rogers et al., 2014). Collaborative research capacity is defined as the skills, values, and resources needed to engage all partners equitably in the full research process. Review of the literature and experience in the conduct of CBPR informed identification of domains of collaborative research capacity that included the following: shared goals, attitudes toward collaboration, institutional factors, mutual respect, human and fiscal resources, partnering skills, and research skills. **Table 1** defines each domain and implications for collaboration.

Figure 1. Building Collaborative Research Capacity Model

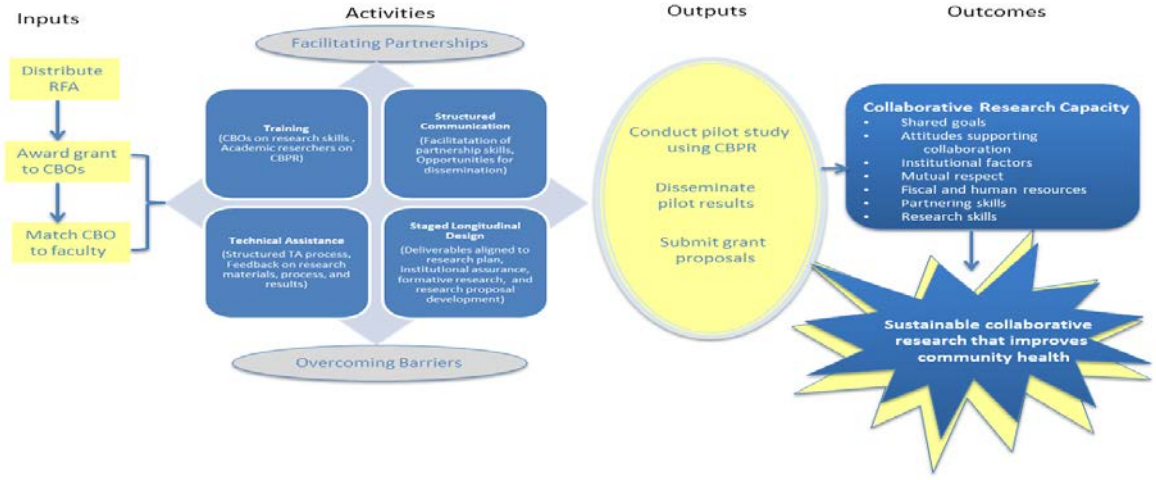

Table 1. Domains for Building Collaborative Research Capacity and Building Collaborative Research Capacity grant program activities

Domain	Definition	Implications for Collaboration
Research Skills	A set of skills required to carry out research, such as study design, instrument development, data analysis	Enhances partner equity and increases likelihood for future collaboration
Shared Goals	Existence of common objectives and/or collaborative activities that contribute to sustaining the partnership	Project remains focused and partners share successes and failures
Attitudes toward Collaboration	Attitudes and organizational cultures that encourage and support community-engaged research	Increases desired outcomes and sustained collaboration in the past Acknowledges potential negative experiences from collaboration in the past
Institutional Factors	Factors existing in academic/CBO systems that encourage or hinder collaborative research	Challenges at the institutional level are recognized and addressed when feasible early in the research process
Mutual Respect	Established rapport or sense of trust	Limits conflict by providing tangible benefits to each partner
Human and Fiscal Resources	The staff, monies, and space to carry out the research	Allocation of monies and resources impact partner equity and ability to carry out research tasks
Partnering skills	A set of skills required to work effectively with others, such as communication, dependability, and transparency	Opens channels of communication and builds trust among partners

Conceptual Framework

The assessment and conceptual framework for the present study is based on CBPR and BCRCM described above and elsewhere (Rogers et al., 2014). CBPR emphasizes an equal partnership, power sharing in decision-making, and data ownership between community and academic partners (Seifer, 2006). This collaborative approach allows creation of interventions that are tailored to a community's needs and existing resources towards increased recruitment, retention, and sustainability. The Building Collaborative Research Capacity Grant Program allowed for assessment of the BCRCM in facilitation of CBPR partnerships through evaluation of partnership dynamics, contexts, and objective outcomes associated with the planning and execution of pilot research studies that were community-driven and partnered with academic researchers.

METHODS

Institutional Review Board Review and Exemption

The aims/objectives of this study were to: 1) measure the impact of the training and technical assistance (TA) on CBO representatives' knowledge, skills, and abilities to plan, implement, and evaluate initiatives addressing health disparities; 2) document community and researcher experiences, perceptions, and recommendations related to the BCRCM; and 3) evaluate the outcomes of facilitated partnerships. This study received an exempt review of evaluation methodology and instruments through the Morehouse School of Medicine Institutional Review Board (IRB, project identification code 131181-1).

Participants and Setting

The program funded four CBOs that were competitively selected from among 29 applicants in metropolitan Atlanta or southwest Georgia counties based on the health area of focus, innovation, and experience (Rogers et al., 2014). Over a two-year period, each CBO received $30,000 to develop a research plan for a pilot study, attend workshops on building research capacity, and implement a pilot study with an academic partner toward submission of a grant proposal.

Community-Academic Researcher Partnerships: Formation and Development

Funded pilot studies and academic partners were: (Partnership A) a Hepatitis B screening, vaccination, and treatment program for the Vietnamese community partnered with an assistant professor of medicine who had an interest in vaccine medicine (Metropolitan Atlanta); (Partnership B) breast and cervical cancer screening behavior and messaging among masculine-identifying African American lesbians paired with an assistant professor of epidemiology who had an interest in cancer prevention (Metropolitan Atlanta); (Partnership C) a clinical trials program among cancer patients coupled with a preventive medicine physician who specialized in informed consent processes (Southwest Georgia); and (Partnership D) the engagement of clients in an HIV/AIDS program, partnered with a tenured professor who had a track record of HIV research among African Americans (Metropolitan Atlanta). IRB approval was obtained for evaluation of these research partnerships.

Capacity Building

CBOs participated in four workshops to build research skills and received TA to plan their pilot study with their matched academic researcher. Training consisted of four workshops totaling 24 hours. One-day workshops were facilitated by a doctorate-level public health specialist. Topics included 1) *Community Assessment*, 2) *Program Planning*, 3) *Evaluation and Research*, and 4) *Grant Writing.* Following the workshops, CBO representatives, in collaboration with an academic researcher, were expected to conduct the pilot study and to develop grant proposals to address a community-identified health disparity.

During implementation of the pilot study, structured TA was provided to all CBOs and academic research partners through monthly teleconferences and e-mail check-ins. TA was facilitated by the public health specialist leading the capacity-building workshops. The purpose of TA was to provide updated information on project requirements, inquire about progress of the project, answer questions, and address any challenges or concerns. TA activities, tailored to meet the needs of the partners, varied across partnerships and were provided upon request.

Assessment/Survey Instruments

The program's evaluation team developed a pre- and post-survey to assess the effect of the training and TA on the knowledge and skills of the CBO representatives to plan, implement, and evaluate initiatives addressing health disparities. CBO representatives completed a face-to-face, self-administered paper survey prior to the training series (baseline) and at the end of the training series (post-test). Self-reported competencies in community assessment, program planning, evaluation and research, and grant writing were assessed on a 5-point Likert scale (1=None, 2=Little, 3=Some, 4=A Lot and 5=Extensive). Seven key informant interviews were conducted with researchers and CBO representatives to identify experiences, perceptions, and recommendations related to the BCRCM and its implementation. Interviews were conducted by use of a standardized script.

Statistical Analysis

For each construct, the mean score was calculated from corresponding survey items, and a paired t-test was used for comparison of pre- and post-test results on community assessment, program planning, evaluation/research, and skills for writing grant proposals. To gauge progress toward increased capacities, survey questions were analyzed, comparing frequency and means for each variable from the pre- and post-surveys. Data analysis was conducted with PASW SPSS 18.0.

Analysis of key informant interviews was preceded by transcription of interviews. Interviews were manually coded by at least two researchers. Once responses were independently coded, evaluation team members met to consolidate findings toward thematic analysis (Braun & Clarke, 2014). Instances of theme discrepancy were discussed until a consensus was reached. To guide analysis of the results, key themes were determined following coder consensus.

RESULTS

Qualitative interview results, survey results, and observations from TA document reviews were detailed by domains of collaborative research developed through the peer-reviewed literature and program implementation that included: *research skills, attitudes toward collaboration, shared goals, institutional factors, mutual respect, human and fiscal resources,* and *partnering skills*. Results were described by evaluation objective and associated domain in the sections that follow. Quotes demonstrating CBO and academic partner perspectives, by selected domains, are included in Table 2.

Table 2. CBO and academic researcher perspectives by selected research capacity domain and themes

Domains/Themes	CBO Perspectives	Academic Research Perspectives
Shared Goals : Documenting the needs	*It helps us to see the need with evidence […] we have evidence to show that yes, that is what's going on with our community*	*Once those findings … [have] been vetted through the scientific process, they (CBO) have a radio station that they actually host [as] an organization. So there will be a radio broadcast about the findings of the studies because many of the people who listen to that radio program were participants in the data collection and will be very interested to hear what we learned.*

Attitudes Towards Collaboration: Delays in Implementation	*You can't get people in the community excited about something and tell them you've got to sit and wait for a couple of months longer. You just piss them off… And so we've had to go back… and explaining and educating and making a little bit more sense out of it.*	*The delays we experienced related to this IRB stuff. And I think that might be an institutional barrier on our side of the fence because I really just thought it was too much to be expecting of a CBO. And probably could have had IRB passed a lot quicker than what we could have. Yeah, so I think that was an institutional barrier.*
Partnering skills: Communication	*We contacted through email at the beginning and we set up a meeting at [CBO] office. [Academic researcher name] came to our office on like – at first it's a monthly basis, then weekly basis. […] So monthly basis, then weekly basis we sat down, we discussed our role and what was her role, and we were divided and we gave each other deadlines and we communicated with each other through email between the time that we met.*	*We would send these follow-up emails that they sort of capture our conversation and usually we would get one of them on the phone as well. So I think they [TA] did a great job of coming to, you know, let's – let's kina send minutes after these phone calls and all agree yes, this is what is going to happen. This is the person responsible and it still didn't seem to make a difference in how things really went.*

Research Skills

Among three of the four CBO respondents, all areas of research capacity skills increased from pre- to post-training, with significant increases for Community Assessment (p = 0.046) and Program Planning (p = 0.046) (Table 3). Item-specific analyses representing central content areas addressed within each skill area demonstrated significant increases from pre- to post-training. Also from pre- to post-training, Community Assessment research capacities significantly increased for *discussing similarities and differences between community assessment and formative research* (p=0.038), *identifying the phases and steps in a community assessment* (p=0.038), and *determining methods to prioritize health issues to address* (p=0.039). For the Program Planning skill area, *research capacities in using theory/evidence-based strategies and activities to plan a program* (p=0.024), *describing behavioral theories commonly used in program planning* (p=0.038), and *creating SMART objectives* (p=0.041) increased.

Table 3. Mean differences in CBO research skills

Training Focus Area	Pre-Training		Post-Training		Paired *T* test
	M	*SD*	*M*	*SD*	
Community Assessment	2.44	0.62	3.15	0.46	2.60*
Program Planning	2.56	0.88	3.33	0.84	2.87*
Evaluation and Research	2.72	0.79	3.37	0.81	1.71
Grant Proposal Writing	1.96	0.97	2.58	1.05	1.02

*$p \leq 0.05$

Attitudes toward Collaboration

Results of key informant interviews demonstrated that academic researchers brought research skills to the partnership. One academic research partner described her role as "partner in helping [the CBO] to determine what their objectives were going to be, TA provider in helping them to develop measures in instruments, grant writer helping them to write at least one additional grant and research lead in that I was able to obtain the IRB approvals and help take the lead on analysis and really guiding the research component." Academic researchers also gained research skills. Some described gaining insights in how to tailor data collection methods for a new population. One gained program–facilitated skills in cognitive interviewing methodology.

Shared Goals

Shared goals that represent mutual benefit to community and research partners are a prerequisite for partnership formation and sustainability (Tendulkar et al., 2011; Allen, Culhane-Pera, Pergament & Call, 2010; Jagosh et al., 2011). For this domain, three major themes emerged from key informant interviews. First, both CBOs and academic research partners expressed interest in learning about the population served by the CBO. CBOs wanted to learn in order to serve communities better; and academic researchers felt that learning, through CBO partnership, made their research more meaningful. Second, a shared interest in pursuing additional grant funding was expressed, as both would benefit from garnering fiscal resources to further their missions. Third, all partners were interested in dissemination of pilot study research, with some CBOs presenting their findings to community and academic

audiences. One academic researcher worked with the CBO partner on a research manuscript.

Institutional Factors

Individual attitudes and organizational cultures can serve as facilitators or barriers to community-engaged research partnerships. These attitudes may be influenced, in part, by perceived benefits that could be gained through the partnership (Tendulkar et al., 2011; Allen, Culhane-Pera, Pergament & Call, 2010; Dobransky-Fasiska et al., 2009; Baker, Homan, Schonhoff & Kreuter, 1999; MacPhee, 2009; Goelman & Pivik, 2011; Braun, Tsark, Santos, Aitaoto & Chong, 2006). Survey responses indicated that CBOs realized benefits through their partnerships with academic researchers. CBO respondents indicated the following benefits as a result of this initiative: *acquisition of knowledge*, *increased utilization of their organization's services* and *resources*, and *support for developing research partnerships*. Academic researchers identified the *enhanced ability to engage community partners, enhanced opportunity to engage in community service, enhanced influence in the community*, and *resources and supports for developing research partnerships* as the primary benefits experienced during the partnership.

All CBO respondents indicated that *challenges getting the projects approved by the ethics committee* were an unanticipated drawback and represented an organizational barrier to timely collaboration. Content analysis of TA meeting notes also showed that navigating the IRB process, obtaining associated approval, and amending protocols presented challenges to the partnerships. Although the overall study was granted an IRB waiver, each subsequently developed pilot study conceptualized by CBO-academic partners required independent IRB review. Most notably, the need to get Federal Wide Assurances (FWAs) for CBOs, which involved fees and added time, stressed resources and delayed the start of data collection in the pilot studies. Explaining the IRB research requirements and timelines to non-academic stakeholders who were ready to begin the collaborative work was also challenging. Some of these difficulties stemmed from university cultures and structures at odds with how CBOs were accustomed to functioning. Both academic researchers and CBOs were new to this process.

Mutual Respect

Mutual respect refers to the process through which a positive rapport between partners is developed by building trust, negotiating boundaries, and acknowledging partner needs and contributions (Dobransky-Fasiska et al., 2009; Minkler & Wallerstein, 2003; Brenner & Manice, 2011). Academic researchers and CBOs agreed that their partners respected their opinions and were not too demanding. When asked whether they trusted their partner, answers varied from agree (66.7%) to strongly agree (33.3%). Most participants felt comfortable approaching their partners to ask questions. Two themes associated with this domain emerged from the qualitative key informant interviews. First, CBOs sought out their academic research partners' expertise for projects beyond the one funded through the program, and, most often, related to evaluation. Second, respect flowed, at least in part, from compatibility. CBOs and academic researchers reported different levels of satisfaction with the matching of researchers to CBOs. Some saw a natural compatibility, but others thought that the match was poor due to lack of academic researcher familiarity with a particular community and/or inability to form a strong working relationship.

Human and Fiscal Resources

Shared human and fiscal resources, including sufficient staff and funding to accomplish research projects, are necessary for successful partnerships (Thompson, Ondelacy, Godina & Coronado, 2010; MacPhee, 2009; Minkler & Wallerstein, 2003; Brenner & Manice, 2011; Andrews, Newman, Meadows, Cox & Bunting, 2010; Browne et al., 2009). The grant provided funding to the CBOs, and selection criteria mandated that their staff devote time to the partnership. Despite this, a priori commitment and provision of external funding, challenges with human resources were common. First, key informant interviews reflected that time was a challenge, particularly with respect to unanticipated IRB delays that made research projects launch later than anticipated. Sustaining commitment to the project was also a challenge, exacerbated, to some extent, by organizational instability and staff turnover. During the project, one CBO discontinued operations due to fiscal challenges; another had staff members either leave or take on different roles that reduced their available time on the project. In another partnership, the researcher left the university, and a new academic partner was engaged, mid-project. The CBO noted that, although the transition in academic research partner required a few months, it was a positive experience overall. Two of the projects utilized students to assist with the work, which facilitated project completion. Two CBOs received additional non-research funding due to program collaboration.

Partnering Skills

In the domain of partnering skills, a theme that emerged from the key informant interviews was the importance of well-functioning communication or lack thereof between CBO staff and academic researchers. Some groups met regularly face-to-face and utilized email intensely; others struggled with effective communication. In addition, follow-through on negotiated tasks and responsibilities, or lack thereof, was considered to be key to effective partnerships.

Partnership Outcomes

Each partnership had inherent characteristics, based on partnership function, which affected the outcomes they attained. Table 4 summarizes partnership characteristics and outcomes. The CBO in Partnership A received IRB approval quickly and also had pre-existing human resource capacity, allowing them to launch their pilot study and collect and

enter a large amount of data quickly. The academic research partner provided data analysis support, and these elements allowed the CBO to achieve the projected deliverables, including the submission of a manuscript to a journal. Despite Partnership B's longest delay for IRB approval, deliverables were driven largely by the CBO even during that time. They used the process as a learning opportunity and presented what they learned at conferences before collecting data. Once IRB approval was obtained and, coincidentally, a new academic research partner was matched, the partnership worked on grant proposals. Partnership C was characterized by the CBO's promising initial proposal; however, the challenges with participant recruitment did not allow for strong pilot study results to support subsequent deliverables. Partnership D had the fewest outcomes due to dissolving of the CBO while in the pilot study phase. This prevented them from producing any subsequent deliverables. The partnership, though, was strong and had the potential to be productive had the CBO continued to exist.

Table 4. Partner descriptions and outcomes of community-academic researcher partnerships

Partnership	CBO/Focus	Faculty Partner Discipline	Shared Research Interest	Outcomes
A	Vietnamese community in Atlanta	Health behavior	Vaccine uptake	Pilot study proposal, IRB approval and pilot study results (required) Service grant received R21 submitted Poster presentation (optional)
B	LGBT community in Atlanta	Cancer epidemiology, then health behavior	Cancer prevention in high-risk populations	Pilot study proposal, IRB approval and pilot study results (required) Service grant received R21 submitted Poster and oral presentations (optional)
C	Cancer patients in South Georgia	Preventive medicine	Informed consent	Pilot study proposal, IRB approval and pilot study results (required)
D	HIV+ individuals in Atlanta	Psychology/health behavior	Quality of life of persons with HIV	Pilot study proposal and IRB approval (required) Organization disbanded

DISCUSSION

Program evaluation through the seven identified domains of collaborative research demonstrated that perceptions held by each community and academic research partner *prior* to partnership formation and CBO-developed research skills and partnership dynamics *during* the partnership should be comprehensively assessed to gauge partnership success in development of research grants (Rogers et al., 2014). Through granting monies to the CBOs, rather than to the academic partners, and providing them with targeted building of research capacity, they were better positioned as senior partners, an approach that is documented in the literature (Thompson, Ondelacy, Godina & Coronado, 2010).

Previous studies have demonstrated that CBO training in the planning, development, and conduct of research facilitates bridging of power imbalances toward effective CBPR (Allen, Culhane-Pera, Pergament & Call, 2010; Dobransky-Fasiska et al., 2009; Baiardi, Brush & Lapides, 2010). Workshops for building of research capacity were designed to prepare CBOs for engaging in pilot research studies with their academic partners through improved research skills. The greatest gains were in program planning and community assessment, with skills gained in the systematic identification and prioritization of health issues, understanding theories that strengthen conceptual frameworks, and the development of evaluation approaches for research grant applications. CBOs recommended adjusting the program training to allow for more practical application of concepts, potentially infusing working sessions into each training session to facilitate partner discussions of theories and concepts and their application to their research project design and implementation.

Each community-campus partnership dyad had distinctive dynamics that were noteworthy in gauging their progress. All partners expressed *shared goals* in addressing

community health, research grant development, and dissemination of pilot study results. *Mutual respect* was also at the core of their reflections on partnerships, with most indicating that they were respectfully heard, the demands made of them were reasonable, and their skills were acknowledged (Tendulkar et al., 2011; Dobransky-Fasiska et al., 2009; Pivek & Goelman, 2011). Broadly recognized *human and fiscal resource* challenges were acknowledged, and *partner skill*s varied, with communication and follow-through as priority issues. The program evaluation demonstrated that shared goals, mutual respect, and positive attitudes toward collaboration were a foundation upon which to build research partnerships, but this foundation may be challenged by organizational concerns related to IRB navigation that may serve as structural barriers. These results confirm claims by Jagosh et al. (2012) that contextual determinants affect CBPR outcomes. The BCRCM also expands upon recent assessments of other community grant programs through its focus on processes associated with CBO capacity building and on longitudinal tracking of outcomes - from pilot study project development to submission of research grant proposals (Thompson, Ondelacy, Godina & Coronado, 2010; Flaman, Nykiforuk, Plotnikoff & Raine, 2010; Allen, Culhane-Pera, Pergament & Call, 2011).

Challenges in Implementation

The IRB process presented challenges, presenting a structural barrier to timely implementation of research. The FWA required of all CBOs engaged in research conducted and reviewed by academic institution IRBs was time-consuming, with costs and delays that were not anticipated. TA logs and related documentation indicated that roles of the academic research partners largely influenced how IRB-related issues affected the relationships between CBOs, academic research partners, and research outcomes. Those partnerships in which the academic research partner led the IRB process and educated the CBO on the process received approval faster than those in which the academic research partner expected the CBO to understand the process and take a lead role in preparing the protocol. Academic partners with community-based experience were also better able to navigate the IRB in a way that minimized CBO frustration. The importance of ethics education and understanding the IRB, beyond communities knowing what they "sign-up" for when participating in clinical trials, has been heightened as federally funded research programs prioritize community-engaged research, where communities not only advise or participate, but may lead or co-lead research and is confirmed by the variance in navigation of each CBO-academic researcher dyad of the IRB processes in this study (Hood, Brewer, Jackson & Wewers, 2010; "Clinical and Translational Science Award," 2011). While no standard exists, recent efforts have begun to amass emerging best-practices in navigation of IRBs in proposed and executed community-engaged research (Geller, Boyce, Ford & Sugarman, 2010; Anderson et al., 2012).

For this study, there are several limitations. First, changes in capacities were self-reported by CBO representatives participating in the program and completing the workshops on building research capacity. Thus, this assessment may not comprehensively reflect the CBOs organizational strengths to plan, implement, and evaluate their interventions. Second, the problem of staff turnover in longitudinal capacity-building is well recognized, and we do not know whether staff turnover resulted in an underestimation or overestimation of the research capacity enhancement observed among the CBOs (Henry Akintobi, Goodin, Trammel, Collins & Blumenthal, 2011). Third, we reported summary scores of knowledge, skills, and abilities with a relatively small number of respondents in each survey (three of four CBOs) who were not matched (pre- to post-test) due to staff turnover and attrition.

This model and assessment expands the literature through a model of CBPR research facilitation processes and outcomes that monitors: 1) changes in research capacities, 2) community-campus partner perceptions of the CBPR capacity-building model, and 3) the outcomes of facilitated partnerships. Below are five recommendations from our shared experience in collaborating with CBOs in the initiative:

- Adopt practical, hands-on learning opportunities that allow for the rapid or immediate application of theoretical frameworks and related topics
- Infuse ethics and IRB education specifically related to community-engaged research for both CBOs and their academic research partners with thoughtful guidance. Facilitate formal meetings and communication between CBOs and academic researchers as early as possible to cultivate communication regarding roles and ensure progress on the collaborative research
- Employ quantitative and qualitative methods to model processes and their linkages to associated research outcomes
- Facilitate technical support, with requirements delineated at program onset
- Provide opportunities for disseminating evidence-based practices to both community and academic audiences

Evaluation of CBPR approaches and the associated partnerships can be challenging when 1) community members have not previously led research initiatives regarding their health priorities, or 2) academic, agency, and neighborhood experts have not historically worked together as a single body with established rules guiding roles and function (Allen, Culhane-Pera, Pergament & Call, 2011; Allen, Culhane-Pera, Pergament & Call, 2010; Henry Akintobi, Goodin, Trammel, Collins & Blumenthal, 2011; Green et al., 1995a,b). Evaluation results for the Building Collaborative Research Capacity Grant Program contribute to the literature through the comprehensive assessment of a model designed to bridge the gap between communities and

academic researchers towards effective community-engaged research.

CONCLUSIONS

The present evaluation included qualitative and quantitative assessment of model domains, barriers and facilitators of partnerships, and outcomes of strategies for building research capacity. The processes and outcomes reported here provide insights on the dimensions germane to facilitating collaborative community-engaged research partnerships and those to anticipate and consider in assessing outcomes. Future research could test this collaborative research model and generate data to improve dimensions of successful community and academic collaboration.

Acknowledgments

This project was funded by Grant Award # 1UL1RR025008 from the National Institutes of Health and through research infrastructure grants including the Centers for Disease Control and Prevention (CDC) Health Promotion and Disease Prevention Research Center (Grant # 1U58DP005945-01), the National Institute on Minority Health and Health Disparities (NIMHHD) (Grant #S21MD000101), and the National Center for Advancing Translational Sciences of the National Institutes of Health under Award Number UL1TR000454. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIMHHD, NCATS, NIH, or the CDC.

References

Allen, M., Culhane-Pera, K., Pergament, S. & Call, K. (2010) Facilitating research faculty participation in CBPR: development of a model based on key informant interviews. Clinical and Translational Science, 3(5):233-238.

Allen, M., Culhane-Pera, K., Pergament, S. & Call, T. (2011). A capacity building program to promote CBPR partnerships between academic researchers and community members. Clinical and Translational Science, 4(6):428-433.

Anderson, E., Solomon, S., Heitman, E., DuBoice, J., Fisher, C., Kost, R., Lawless, M., Ramsey, C., Jones, B., Ammerman, A. & Ross, L. (2012). Research ethics education for community engaged research: a review and research agenda. Journal of Empirical Research in Human Research Ethics, 7(2):3-19.

Andrews, J., Newman, S., Meadows, O., Cox, M. & Bunting, S. (2010). Partnership readiness for community-based participatory research. Health Education Research.

Baiardi, J., Brush, B. & Lapides, S. (2010). Common issues, different approaches: strategies for community-academic partnership development. Nursing Inquiry, 17(4):289-296.

Baker, E., Homan, S., Schonhoff, R. & Kreuter, M. (1999). Principles of practice for academic/practice/community research partnerships. American Journal of Preventive Medicine, 16(3):86-93.

Blumenthal, D. (2006). A community coalition board creates a set of values for community-based research. Preventing Chronic Disease, 3(1):A16. PubMed PMID: 16356369.

Braun, K., Tsark, J., Santos, L., Aitaoto, N. & Chong, C. (2006) Building native Hawaiian capacity in cancer research and programming - A legacy of 'Imi Hale. Cancer, 107(8):2082-2090.

Braun, V. & Clarke, V. (2014) What can “thematic analysis” offer health and wellbeing researchers. International Journal of Qualitative Studies on Health and Well-being, 9. doi:10.3402/qhw.v9.26152.

Brenner, B. & Manice, M. (2011). Community engagement in children's environmental health research. The Mt. Sinai Journal of Medicine, 78(1):85-97.

Browne, R., Vaughn, N., Siddiqui, N., Brown, N., Delmoor, E., Randleman, P., Randleman, S., Gonzalez, L., Lewis, J., Lourie, R., Foster, G., Brown, H., Fraser-White, M. & Banks, S. (2009). Community-academic partnerships: lessons learned from replicating a salon based health education and promotion program. Progress in Community Health Partnerships, 3(3):241-248.

Cargo, M. & Mercer, S. (2008). The value and challenges of participatory research: strengthening its practice [Review]. Annual Review of Public Health, 29:325-50. doi: 10.1146/annurev.publhealth.29.091307.083824.

Clinical and Translational Science Award Community Engagement Key Function Committee Task Force on the Principles of Community Engagement. (2011). Principles of Community Engagement. 2nd ed. Washington (DC): U.S.DHHS.

Dobransky-Fasiska, D., Brown, C., Pincus, H., Nowalk, M., Wieland, M., Parker, L., Cruz, M., McMurray, M., Mulsant, M. & Reynolds, C. (2009). Developing a community academic partnership to improve recognition and treatment of depression in underserved African American and white elders. American Journal of Geriatric Psychiatry, 17(11):953-964.

Flaman, L., Nykiforuk, C., Plotnikoff, R. & Raine, K. (2010). Exploring facilitators and barriers to individual and organizational level capacity building: Outcomes of participation in a community priority setting workshop. Global Health Promotion, 17:34-43.

Geller, G., Boyce, A., Ford, D. & Sugarman, J. (2010). Beyond “compliance”: the role of institutional culture in promoting research integrity. Academic Medicine, 85(8):1296-1302.

Goelman, H. & Pivik, J. (2011). Evaluation of a community-based participatory research consortium from the perspective of academics and community service providers focused on child health and well-being. Health Education Behavior, 38(3):271-281.

Green, L., George, M., Daniel, M., Frankish, C., Herbert, C., Bowie, W. & O’Neill, M (1995a). Study of participatory research in health promotion. University of British Columbia, Vancouver: The Royal Society of Canada.

Green, L., Miller, R., Nutting, P., Petersen, L., Stewart, L., Marshall, G. & Main, D. (1995b). Human immunodeficiency virus seroprevalence in community-based primary care practices, 1990-1992. A report from the Ambulatory Sentinel Practice Network.Archives of Family Medicine, 4(12):1042-7.

Henry Akintobi, T., Goodin, L., Trammel, E., Collins, D. & Blumenthal, D. (2011). “How do you set up and maintain a community advisory board?” Section 4b of “Challenges in Improving Community Engagement in Research,” Chapter 5 of The Clinical and Translational Science Awards Community Engagement Key Function Committee Task Force on the Principles of Community Engagement. Principles of Community. Engagement, 2nd Edition. Washington, DC: U.S. Department of Health and Human Services.

Hood, N., Brewer, T., Jackson, R. & Wewers, M. (2010). Survey of community engagement in NIH funded research, Clinical and Translational Science, 3(1):19-22.

Israel, B., Schulz, A., Parker, E. & Becker, A. (1998). Review of community-based research: Assessing partnership approaches to

improve public health. Annual Review of Public Health, 19:173–202.

Jagosh, J., Macaulay, A., Pluye, P., Salsberg, J., Bush, P., Henderson, J., Sirett, E., Wong, G., Cargo, M., Herbert, C., Seifer, S., Green, L. & Greenhalgh, T. (2012). Uncovering the benefits of participatory research: implications of a realist review for health research and practice. Milbank Q, 90(2):311-46. doi: 10.1111/j.1468 0009.2012.00665.x.

Jagosh, J., Pluye, P., Macaulay, A., Salsberg, J., Henderson, J., Sirett, E., Bush, P., Seller, R., Wong, G., Greenhalgh, T., Cargo, M., Herbert, C., Seifer, S. & Green, L. (2011). Assessing the outcomes of participatory research: protocol for identifying, selecting, appraising and synthesizing the literature for realist review. Implement Science, 6:24.

Macaulay, A., Delormier, T., McComber, A., Cross, E., Potvin, L., Paradis, G., Kirby, R., Saad-Haddad, C. & Desrosiers, S. (1998). Participatory research with native community of Kahnawake creates innovative code of research ethics. Canadian Journal of Public Health, 89(2):105-8. PubMed PMID: 9583251.

MacPhee, M. (2009). Developing a practice-academic partnership logic model. Nursing Outlook, 57(3):143-147.

Minkler, M., & Wallerstein, N., editors. (2003). Introduction to community based participatory research. Community Based Participatory Research. San Francisco: Jossey-Bass.

O'Fallon, L. & Dearry, A. (2002) Community-based participatory research as a tool to advance environmental health sciences. Environmental Health Perspectives, 110 Suppl 2:155-9. PubMed PMID: 11929724.

Pivek, J. & Goelman, H. (2011) Evaluation of community-based participatory research consortium from the perspective of academics and community service providers focused on child health well-being. Health Education and Behavior, 38(3):271-281.

Rogers, K., Akintobi, T., Thompson, W., Escoffery, C., Evans, D. & Kegler, M. (2014). A model for strengthening collaborative research capacity: illustrations from the Atlanta clinical translational science institute. Health Education and Behavior, 41(3):267-274. PMID: 24311741.

Sandoval, J., Lucero, J., Oetzel, J., Avila, M., Belone, L., Mau, M., Pearson, M., Tafoya, G., Duran, B., Rios, L. & Wallerstein, N. (2012). Process and outcome constructs for evaluating community-based participatory research projects: a matrix of existing measures. Health Education Research, 27(4):680–690.

Seifer, S. & Sisco, S. (2006). Mining the challenges of CBPR for improvements in urban health. Journal of Urban Health, 83(6):981-4. PubMed PMID: 17109205.

Seifer S. Building and sustaining community-institutional partnerships for prevention research: Findings from a national collaborative. *J Urban Health*. 2006; 83(6):989–1003.

Tendulkar, S., Chu, J., Opp, J., Geller, A., Digirolamo, A., Gandelman, E., Grullon, M., Patil, P., King, S. & Hacker, K. (2011). A funding initiative for community-based participatory research: lessons from the Harvard Catalyst Seed Grants. Progress in Community Health Partnerships, 5(1):35-44.

Thompson, B. Ondelacy, S., Godina, R. & Coronado, G. (2010). A small grants program to involve communities in research. Journal of Community Health, 35(3):294-301.

Wallerstein, N. & Duran, B. (2006). Using community-based participatory research to address health disparities. Health Promotion Practice, 7:1–12.

Wallerstein, N. & Duran, B. (2010). Community-based participatory research contributions to intervention research: the intersection of science and practice to improve health equity. American Journal of Public Health, 100 Suppl 1:S40-6. doi:10.2105/AJPH.2009.184036. PubMed PMID: 20147663.

Waterman, C., Carter, N., Khan, K., Petit, M., Heinonen, A., Donaldson, M., Janssen, P., Mallinson, A., Riddell, L., Kruse, K., Prior, J., Flicker, L. & McKay, H. (2001). Results of a 10 week community based strength and balance training program to reduce fall risk factors: a randomized controlled trial in 65-75 year old women with osteoporosis. British Journal of Sports Medicine, 35(5):348-51.