

# Engaging the Dan River Region to Reduce Obesity

## Application of the Comprehensive Participatory Planning and Evaluation Process

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Despite ongoing recommendations to engage health-disparate populations in the initiation and execution of community-based research, few studies report on the process of community engagement. The action-oriented Comprehensive Participatory Planning and Evaluation (CPPE) process is designed to guide community health planning and evaluation. This article describes how the CPPE process was utilized within a community-based participatory research initiative aimed at addressing obesity in the health-disparate Dan River Region. Encouraging community engagement in formulating research agendas and promoting ownership of health solutions will be key to improving obesity risk factors among Dan River Region residents, and similar vulnerable communities.

**Key words:** *community-based participatory research, health status disparities, obesity, process assessment*

**C**OMMUNITY-BASED participatory research (CBPR) is a recognized approach to identify and address social and public health issues in health-disparate populations.<sup>1-3</sup> Effective CBPR initiatives utilize the collective knowledge, expertise, and

resources gained through community-academic partnerships to develop and execute culturally effective interventions as prioritized by the community.<sup>4-6</sup> The initial 3 phases of CBPR include forming a partnership, assessing community strengths/dynamics, and identifying priority public health issues/research questions. These 3 phases are considered to be among the most critical.<sup>1-2</sup> These phases influence how prepared and engaged the community is to develop action-oriented plans, and how effectively the partnership can execute plans to produce desired outcomes and sustain their efforts. Central components in each phase are equitable and active participation of all partners, ideally from initial engagement, as well as sustainability and advancement of the partnership.<sup>1-4,6-10</sup>

Various planning models have been developed to engage community participation in these phases; however, published studies documenting the extent of community member involvement through each of the core phases varies greatly.<sup>6,11,12</sup> Despite

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ongoing recommendations to engage community participation,<sup>6,11,13</sup> a seminal CBPR review by Viswanathan and colleagues<sup>6</sup> reveals that less than half of the studies reported involvement of community members to help to set priorities and generate hypotheses. Consequently, it is important to understand the process and utility of community planning models that actively engage community members in formulating and implementing health-related research agendas.

The Comprehensive Participatory Planning and Evaluation (CPPE) process is an action-oriented approach designed to guide project planning and evaluation in communities and consists of 5 steps including: (1) problem assessments, (2) identification and selection of potential interventions, (3) planning, (4) intervention proposal development, and (5) monitoring and evaluation.<sup>14</sup> Each step in the approach is flexible and may be adapted to match the current stage of the community in the project development and execution processes. Many aspects of the CPPE process are complementary to CBPR.<sup>1,2,14</sup> For example, the involvement of the community in all planning phases aims to increase motivation and colearning, and ultimately the success and maintenance of the projects. Also, active participation by the community allows local expertise and priorities to drive the research and demonstrates that the community has the capacity to solve its own problems.<sup>1,2,14</sup> Therefore, utilizing the CPPE process within an ongoing CBPR partnership has the potential to transition a community into the action-oriented phases of research, while remaining true to CBPR principles. Once in the action phases of research, integrating CBPR and CPPE promotes the sustainability of research efforts through the continued utilization of a community participatory structure that promotes resource sharing and employs local knowledge and expertise to drive the translation and dissemination of study findings. Despite the projected appeal and appropriateness of the CPPE process within CBPR, only 1 known published study has explored its utility and effectiveness.<sup>15</sup> Further

exploration and utilization of CPPE within other health-disparate communities provides valuable information needed to more fully understand how to appropriately engage at-risk communities to transition from the needs-assessment phase to the intervention-planning and implementation phases.

### **Formation of the CBPR partnership and community-needs assessment**

The Dan River Region, located in south-central Virginia and north-central North Carolina, is a medically underserved region, suffering from health and economic disparities.<sup>16,17</sup> During the last 3 years, 3 comprehensive needs assessments have been completed in this region.<sup>18-20</sup> These needs assessments identified obesity as a priority health issue for the region. In addition, concerns related to the capacity of community organizations to design and implement effective and sustainable solutions were detailed.

On the basis of these assessments, in November 2009, the Danville Regional Foundation, the largest philanthropic foundation in the region, hosted the first roundtable "Regional Conversation on Obesity" to discuss the development of a unified community effort. The Danville Regional Foundation invited representatives from key sectors, including civic, faith-based, public/private health care, local government, and education who had previously demonstrated long-term commitment to addressing regional health issues. Research faculty from Virginia Tech, including a native of the Dan River Region, participated in the round table discussion. Including Virginia Tech staff and faculty, 22 of 24 (92%) invited regional stakeholders attended the roundtable. As a result, opportunities to develop a community-academic partnership to reduce obesity were realized. In subsequent follow-up meetings, 2 local organizations, the Danville Regional Foundation and the Martinsville Henry County Coalition for Health and Wellness, pooled resources with Virginia Tech researchers to cooperate as the organizing steering committee for the partnership.

The steering committee organized a follow-up roundtable for previous invitees in February 2010, and expanded the invitation list to gain a wider representation of regional community members. Additional sectors invited included small business owners, county public health care providers, county schools representatives, and grassroots social justice organizations. Seventy percent of invited regional stakeholders attended. Meeting agenda items focused on exploring interest in formally organizing a collaborative obesity task force. The researchers formally introduced the principles of CBPR and the CPPE process as a possible approach to initiate obesity-related interventions. There was an overwhelmingly positive response from the stakeholders to support a community-academic partnership. Because of the complex nature of the health disparities influencing obesity, the stakeholders confirmed that a collaborative regional obesity task force was the most effective mechanism to assess and execute strategies beyond individual-level interventions to include various social and community-level influences. Researchers and community stakeholders agreed that a CBPR partnership based on mutual trust, commitment to the process, shared learning, and shared power would be appropriate. Of the attendees responding to a brief survey, 93% expressed an interest in participating in a future CPPE workshop.

This article describes how the community-academic partnership executed each step of the CPPE process to move from the needs-assessment phase to the action-oriented phases. The ways in which the CPPE process has empowered the partnership to launch research efforts prioritized by the CBPR partnership, hereafter referred to as the Dan River Region Obesity Task Force, is also discussed.

## METHODS

### Study area and participants

The Dan River Region includes the city of Danville, Pittsylvania county, and Henry

county in Virginia, as well as Caswell county, North Carolina. This predominately rural region is suffering in the current economic recession with unemployment rates almost double those of the state and national averages.<sup>21</sup> Furthermore, each of these counties have been designated by the US Department of Health and Human Services as a medically underserved area.<sup>16</sup> In the region, 50% are women, 27% black, 16.5% live below the Federal Poverty Level, and only 9% have obtained a bachelor's degree.<sup>22</sup> High indices of poverty, low educational attainment, and health disparities persist in each of these areas making this region 1 of the most health disparate regions in the Commonwealth.<sup>17,23</sup> Despite these challenges, a tremendous asset to the region is the motivated stakeholders from a variety of public, private, and government sectors within each county willing to collaborate in addressing these concerns.

### CPPE process steps 1 and 2: problem assessments and identification of potential interventions

An overview of the CPPE steps and associated approaches executed by the Dan River Region Obesity Task Force are illustrated in Table 1. The primary purpose of the problem-assessment phase of the CPPE process is to gain insight into the root causes of the identified problem.<sup>14</sup> This phase consists of preliminary problem assessment, the CPPE causal analysis workshop, supplemental data collection and model validation, and causal model data analysis.<sup>14</sup> As mentioned, the regional roundtables and comprehensive needs assessments were previously executed and obesity was identified as the priority problem. Therefore, initiation from the "preliminary problem assessment phase" was not necessary. The causal analysis workshop provides a stepwise approach that allows intervention ideas to emerge by working backward from the identified priority problem to explore the potential mechanisms and root causes of the problem.<sup>14</sup> Unlike traditional social science whereby causal models are

**Table 1.** Summary of the CPPE Process and Results

CPPE Step	Approach and Goal	Participants	Results
Step 1: problem assessment (April 2010) *Obesity was previously identified by the community as the priority problem	Causal model workshop Goal(s): to identify root causes of obesity; create visual models for these causes	Total attendance (n = 28 of 38 invited; 74% participation rate) Community members (n = 25); Academic members (n = 3)	6 causal models: Education Nutrition Social norms Physical activity Geographic planning Environment
Step 2: identification and priority ranking of potential interventions (April 2010)	Causal model workshop (day 2) Goal(s): prioritize causal models; develop potential intervention ideas for prioritized models	Total attendance (n = 27 of 38 invited; 71% participation rate) Community members (n = 24); Academic members (n = 3)	3 prioritized interventions: Social support to promote physical activity Social marketing to shift health-related cultural and social norms Using community gardens to increase accessibility to fresh/local foods *representing the prioritized causal models: physical activity, social norms, and nutrition
Steps 3 & 4: planning and development of intervention proposals (April 2010-ongoing)	Monthly subcommittee meetings Goal(s): HIPPOPOC tables to further develop intervention ideas <sup>14</sup> develop, write, and submit funding proposals to conduct proposed interventions	Total attendance (n = ~ 25) Community members (n = ~18); Academic members (n = ~7) Obesity Task Force subcommittees: Nutrition (n = ~9) Physical (n = ~6) Education (n = ~5) Social marketing (n = ~5)	Intervention development: Subcommittees utilize HIPPOPOC templates to further develop intervention ideas <sup>14</sup> Grant proposals submitted (n = 6) Funded (n = 4) 2; Virginia Foundation for Healthy Youth 2; Danville Regional Foundation "Make it Happen!" Grants <i>(continues)</i>

**Table 1.** Summary of the CPPE Process and Results (*Continued*)

CPPE Step	Approach and Goal	Participants	Results
Step 5: monitoring and evaluation (June 2010-ongoing)	Goal(s): conduct baseline community capacity evaluation  determine interest in community gardening using mixed methods pilot study	Community capacity baseline evaluation n = 12 Obesity Task Force members (75% participation rate among eligible members)  Community Gardens n = 67 parents (51% black) n = 87 children (54% black)  n = 10 key informant interviews  n = 46 attendees at community-wide forum	Under review/revision (n = 2) 1; Robert Wood Johnson foundation 1; National Institutes of Health  Community capacity Audio tapes transcribed verbatim, coding of transcripts, and data analysis is ongoing  Community gardens Pilot study revealed interest in gardening among parents and youth in the Dan River Region  Among parents, gardening attitudes and gardening beliefs provided a strong prediction for intentions to garden at home ( $R^2 = 0.40$ ; $F = 20.7, P < .01$ )  Key stakeholders in the community identified barriers and expressed interest in launching community gardens in the Dan River Region  Attendees identify established and emerging community gardens and recognized the need for focused evaluation strategies to document community-wide effectiveness of community gardens  Physical activity and nutrition intervention: baseline evaluation completed and follow-up currently in progress including body mass index, blood pressure, psychosocial measures, quality of life, accelerometers, and attendance tracking

Abbreviations: CPPE, Comprehensive Participatory Planning and Evaluation; HIPPOPOC, inputs-processes-outputs-outcome.

developed on the basis of underlying theories and directional hypotheses as well as tested through empirical analytical techniques, the community-engaged developmental step of the CPPE causal models are different. For example, CPPE causal models do not necessarily have to portray a hierarchical structure or infer causation, rather they are meant to uncover the complexity of problems and encourage participants to discuss potential solutions. Furthermore, while generating a testable hypothesis is certainly an intermediate goal of the CPPE process, it is not the central goal that drives the initial steps in the building of causal models. Doing such could stifle the communication and acceptance of the CPPE process when trying to engage diverse community stakeholders.

Remaining true to CBPR principles, the steering committee structured the workshop to encourage equitable participation, and utilized a skilled facilitator who was independent of the community-academic team to lead the CPPE workshops. During day 1 of the workshop, in a large group discussion, participants were asked to "broadly describe their vision for a healthy Dan River Region." The facilitator listed all responses on large easel pads. These responses reflected numerous aspects, which were all broadly related to health and healthy living. The group then began to reduce this list to those items specifically related to obesity, and then sorted those items into major themes, with care given to provide ample discussion around potential gaps and overlap of ideas. Six major themes emerged, and the facilitator randomly divided the participants into 6 small working groups with an average of 5 people per group. Before the start of the meeting, colored sticky notes were placed underneath the unassigned chairs, and color matching was used for random assignment to groups. Members of the research team and steering committee participated in each group. The role of research staff was to facilitate all voices being heard in the small groups, and to document the process, but not to actively direct the discussion. Each group drafted creative visual representations

that linked the root causes, influential factors, and determinants back to their obesity-related theme. A spokesperson from each group presented the information back to the larger group.

During day 2 of the workshop, while in the large group, participants began to review the causal models developed the previous day. To prioritize intervention efforts, participants ranked models that the newly developed Obesity Task Force and community were best positioned to address. Participants chose to further develop the top 4 models and the facilitator randomly divided the group into 4 small working groups with an average of 6 people per group. To ensure consistency in the continuous development of the models, the designated spokesperson from the previous day remained with the same model; however, the facilitator randomly reassigned the other community members to alternate causal model groups to offer fresh insights, alternative ideas, and to encourage communication among the participants. One to 2 members of the research team and/or steering committee assisted in each of the small group facilitations but did not direct the process. Participants concluded the workshop with a review and validation of the causal models and intervention priorities. Participants provided oral feedback about the logistics of the workshops, as well as steps to organize the next task force meeting to maintain planning and implementation momentum.

At the end of each day, members of the steering committee debriefed with the facilitator. To honor and utilize the richness of information provided by the participants, the causal models were coded for components tied to a social ecological framework.<sup>24</sup> Social ecological frameworks attend to the personal, interpersonal, organizational, societal, and political contexts in which behavior occurs, and how these contexts influence individual behavior. Two researchers independently coded the root causes within the causal models into 4 primary levels: individual, peer/family, local community, and the larger society (Figures 1-4).<sup>24</sup> These researchers then met to synthesize

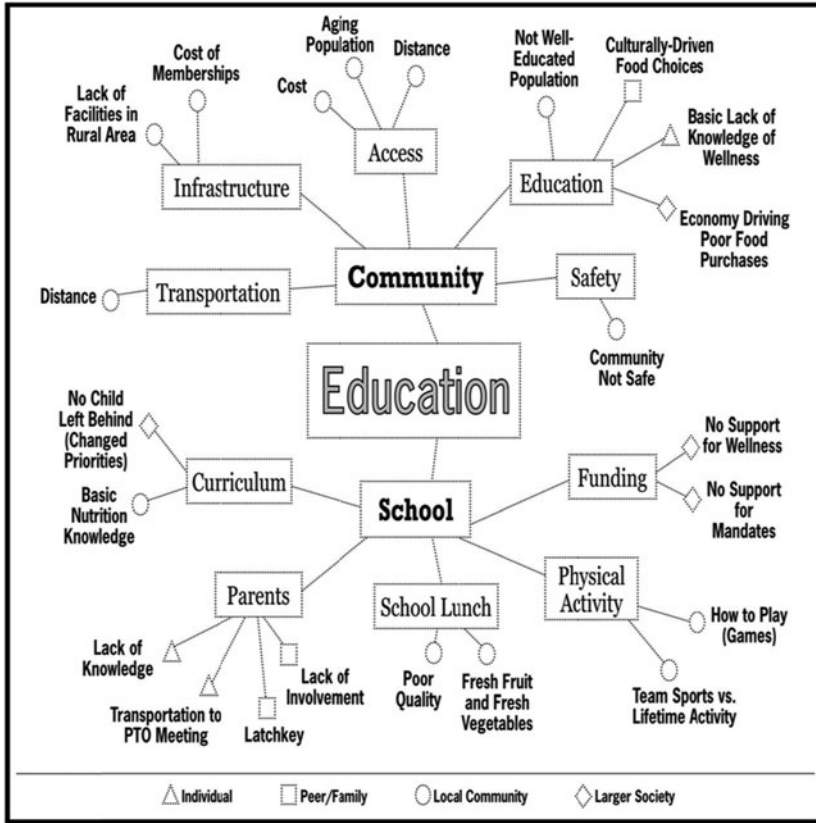


Figure 1. Education causal model.

findings, resolve uncertainty, and to gain consensus in socioecological coding.

**CPPE steps 3 and 4: planning and intervention proposal development**

In June 2010, the Dan River Region Obesity Task Force formalized its partnership and hosted its first meeting. A schedule for meeting frequency and structure were established. Quarterly meetings were organized as a large group meeting to promote development and progression of the partnership. Monthly subcommittee meetings were organized around key themes from the causal models and the prioritized intervention areas, and task force members began to further develop intervention strategies. To aid intervention development, and as proposed in the CPPE process, subcommittees completed a HIPPOPOC

(Inputs, Processes, Outputs, Outcomes) template for each intervention.<sup>14</sup> Key steps of the HIPPOPOC process include formulating and prioritizing broad objectives and design of interventions, as well as identifying inputs, processes, outputs, and outcomes.

**CPPE steps 5: monitoring and evaluation**

A variety of process and outcome evaluation methods have been initiated to promote task force development and advance the prioritized interventions; however, monitoring and evaluation remain in the very early stages. As described in Table 1, evaluation approaches that have been launched include key informant surveys, cross-sectional surveys, a randomized-controlled trial, and environmental mapping of physical activity and nutrition outlets.

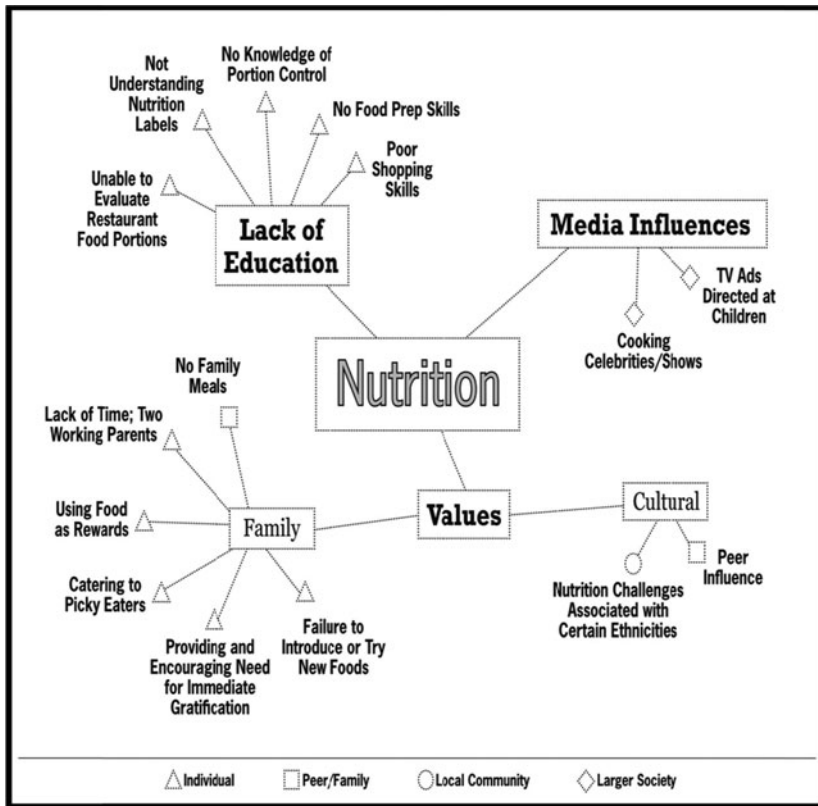


Figure 2. Nutrition causal model.

**RESULTS**

Table 1 further summarizes participants involved in each of the CPPE steps and results to provide supporting evidence of successful execution of each CPPE step.

**CPPE process steps 1 and 2: problem assessment and identification of potential interventions**

Thirty-eight community members and 4 members of the Virginia Tech research team were invited by e-mail and word of mouth to participate in the 2-part CPPE workshop. Snowball sampling, beginning with the attendees of both obesity roundtables, was used to assist in identifying community members to participate. Aligned with CBPR principles and CPPE process objectives, targeted partic-

ipants represented or worked closely with the communities most affected by obesity, agreed to collaboratively develop and implement community-driven interventions, and were dedicated to the immediate and long-term process to achieve the projected goals of the Obesity Task Force. Stakeholders represented the following sectors: health care, education, local government, civic organizations, faith-based institutions, public schools, higher-education institutions, local business owners, public housing, and community activism. On the basis of an average attendance rate for both days, 41% (n = 11) of the community participants were African American, 59% (n = 16) were white, and 85% were female.

As detailed in Table 1, 6 causal models were developed. As a result of the causal model workshop, day 2 was used to further develop 4 of the 6 models, as illustrated in Figures



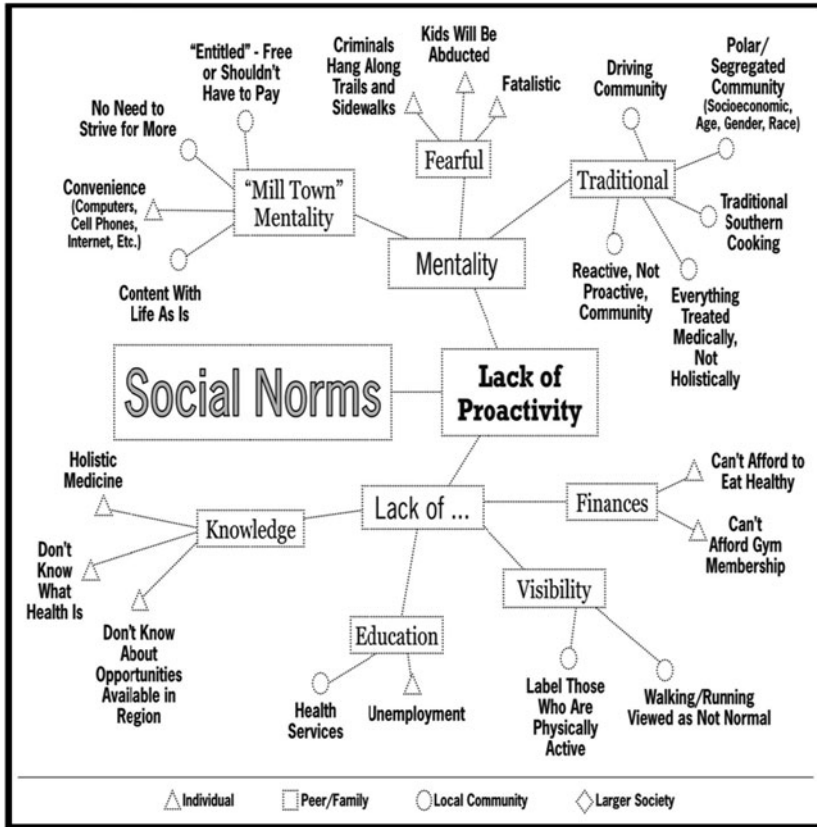


Figure 3. Social norms causal model.

1-4, into potential intervention ideas. Using selection criteria set by the participants that included areas of overlap, potential partnership opportunities, resource availability, and general enthusiasm for an idea, 3 prioritized intervention ideas materialized (Table 1).

**CPPE steps 3 and 4: planning and intervention proposal development**

Since the CPPE workshops, the Obesity Task Force has continued to meet monthly to advance intervention development and implementation. Convening over a 90-minute lunch, attendees typically meet as a large group for 30 minutes, then divide into smaller working subcommittees for the remaining time. Subcommittees completed the HIP-POPOC intervention templates for a social support physical activity intervention, a so-

cial marketing campaign, community garden programming, and youth and school based education wellness programming. As a result of this planning phase, the Obesity Task Force prioritized and reorganized their subcommittees to focus on 2 interventions that gained the most momentum during development and were best positioned to receive funding. The nutrition subcommittee focused on developing a community garden/education program located in the city of Danville, whereas the physical-activity subcommittee focused on developing and implementing a social support physical activity program in Caswell county.

The successful series of subcommittee meetings and collaborative engagement of community and academic members has led to successful grant proposals by members of the Obesity Task Force. In September 2010, grant funding was secured from the

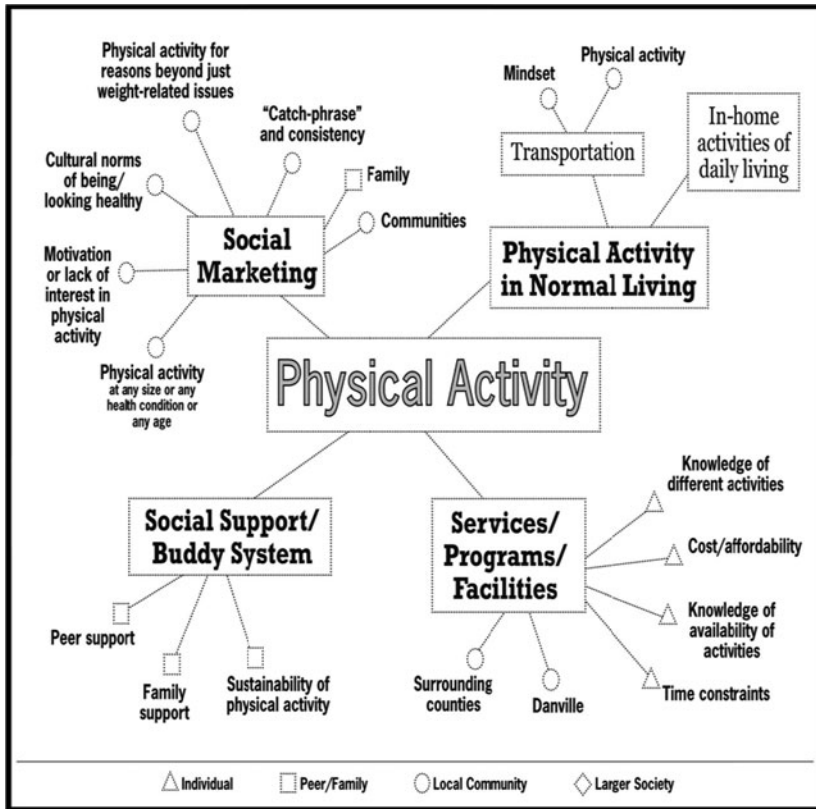


Figure 4. Physical activity causal model.

Virginia Foundation for Healthy Youth to further progress and evaluate the Obesity Task Force, to plan and promote the development of community gardens, and to assess the nutrition and built environment as it related to obesity. Two community members also successfully applied for and received the Danville Regional Foundation “Make it Happen” grant to launch their community garden projects. In addition, a Robert Wood Johnson Grant is currently under review to focus on the public health impact of community gardens and the effectiveness of community gardening efforts to impact the “in home” accessibility of fruits and vegetables among public housing residents in the Dan River Region. Finally, an R21 National Institutes of Health grant proposal is under revision to advance the region’s capacity to provide social support programming to promote physical activity.

**CPPE phase 5: monitoring and evaluation**

The ongoing community capacity evaluation framework has included key informant interviews of Obesity Task Force members to establish the extent to which the partnership is collaborative, participatory, and productive. Development and execution of this theory-based evaluation was guided by community input and focused on community capacity dimensions perceived as most relevant and appropriate to the progress of the Obesity Task Force.<sup>8,25</sup>

To advance the prioritized interventions, numerous other evaluations have been launched. As a result of the nutrition subcommittee progress, a mixed methods study was executed to inform development of a community garden program in the Dan River Region.<sup>26</sup> The qualitative phase, which

included 10 regional key informants, was designed to elicit perceived benefits and challenges of community gardens at the environmental, community, and individual levels. The quantitative phase targeted low-resourced youth ( $n = 87$ ) and their parents ( $n = 67$ ), and included a variety of validated theory-based questionnaires to understand factors impacting fruit, vegetable, and gardening behaviors. This research has provided the partnership with a clearer lens to conceptualize and launch future regional community garden efforts (unpublished manuscript in review). In addition, the physical-activity subcommittee pooled resources and acquired additional partners to launch a 2-group randomized 15-week nutrition and physical activity pilot study called "Better Together: Healthy Caswell County." The study aims to determine the effectiveness of increasing access to physical activity, with and without weekly nutrition and physical activity education sessions. Ninety participants were enrolled and some of the outcomes being assessed include body mass index, blood pressure, self-reported physical activity levels, self-reported dietary intake, psychosocial measures, and quality of life. While the study is ongoing, preliminary analysis indicates a significant time effect and group by time effect for body mass index (unpublished data).

Finally, although not associated with a particular subcommittee, global information system (GIS) mapping and audit efforts are underway to attend to the geographic and environmental causal models, and to better understand the contextual factors related to obesity in the Dan River region. For example, block-level GIS maps are being developed to provide spatial data including walkability, physical activity resources, and food outlets in all 3 counties. Data collection and analysis are still underway for each of these environmental indices. In brief, a walkability index was calculated from intersection density, residential density, and land use mix for each block group. Block groups were subsequently categorized as high, medium, or low walkability on the basis of the calculated index.<sup>27</sup> The

availability, type, and quality of physical activity resources are being assessed with the Physical Activity Resource Assessment.<sup>28</sup> Furthermore, baseline data on food quality, price, and availability is currently being collected and analyzed in accordance with the Nutrition Environment Measurement Survey procedures.<sup>29</sup> Once this data is collected, analyzed, and summarized, the information will be shared with the Obesity Task Force, and will be used to inform policy efforts and future intervention projects.

## DISCUSSION

This article documents the process used to foster a cohesive community-academic partnership and discusses the interventions and evaluation data that reflect a successful partnership. The CPPE workshop helped to advance the capacity-building process and transitioning the community into action-oriented planning. Engagement of local expertise to drive the research and intervention priorities was a key aspect in launching this partnership.

Similar to Ndirangu and colleagues,<sup>15</sup> we found the CPPE process aligns with and fosters many of the fundamental principles in CBPR, making it particularly useful in such community-academic partnerships. By design, the CPPE process is adaptive, providing flexibility for those who are beyond the needs assessment or problem identification stages.<sup>14,15</sup> During the CPPE process presented here, community members acted as the experts for conceptualizing the obesity-related causal models, developing locally relevant interventions, and prioritizing those interventions for collective success, honoring the overall CBPR mission of the partnership. Community and academic team members emerged as equitable owners for executing and evaluating interventions for this region.<sup>1,2</sup> For this newly formed Obesity Task Force, the interactive nature of the causal analysis workshop initiated trusting relationships, which is noted as being a critical component to promote long-term success of partnerships.<sup>1-3</sup> Promotion of partnership

equity has transcended the ongoing monthly task force and subcommittee meetings, as attendance and participation remains high, and talented community members have assumed key roles in leading agenda items.

In addition to supporting the evolution of this partnership, the results of the causal analysis workshop positioned the Obesity Task Force to readily develop ideas into pilot projects and funding proposals. Early tangible success is reflected in the causal models, dynamic HIPPOPOC working documents, and submitted and funded grant proposals. Furthermore, the socioecological framework grounding the causal models provides a theoretical foundation to guide effective intervention development. Utilizing the causal models to encourage Obesity Task Force members to be mindful of personal, interpersonal, organizational, societal, and political contexts influencing obesity will aid in the development of comprehensive programs. Importantly, other CBPR initiatives have realized success through application of the socioecological model to address health disparities.<sup>30</sup> In addition, a neighboring rural community facing similar economic and health challenges has demonstrated the importance of linking individual health behavior strategies to broader services and policies to improve regional health.<sup>31</sup>

Although there has been little application of the CPPE process to other CBPR coalitions, our findings support the utility of the CPPE process to transition into an action-

oriented research agenda.<sup>15</sup> For communities that are further accomplished in identifying health needs and building CBPR coalitions, the CPPE process offers a unique and action-oriented alternative approach to other traditional comprehensive planning models.<sup>32-35</sup> Given the dearth of published research related to application of CPPE, future research is needed to evaluate the utility of the CPPE process in other health-disparate communities and across other health contexts. The continued utilization of the CPPE process in this community as well as in subsequent studies can help to create a path by which the application and effectiveness of participatory methods are looked at not only for communities initiating progress, but also for those who have achieved greater progress.

In conclusion, as a result of the CPPE process, a collaborative community coalition is uniquely positioned in the Dan River Region to make collective steps toward obesity reduction and improved community health. Creating a sense of community power and promoting community ownership of the individual, social, and environmental health problems and solutions will be imperative to improving the obesity risk factors and the long-term health of residents in this region. Continued monitoring and evaluation of these efforts are critical to understanding the long-term effects related to obesity, as well as partnership productivity and sustainability.

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