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Critical discourse, applied inquiry and public health action with urban middle school students: Lessons learned engaging youth in critical service-learning

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Abstract

The Nuestro Futuro Saludable partnership designed a critical service-learning intervention focused on health equity and action. The ten-week afterschool intervention was implemented in a Boston middle school. Youths who took part in the intervention were knowledgeable about the social determinants of health in their communities, as well as to the barriers to health. Our findings indicate that engaging young people in a meaningful way will be critical if health improvement efforts are to be realized. We found that a critical service-learning framework that incorporates elements of applied inquiry and critical pedagogy was effective as a health intervention and provided opportunities for action.

Keywords

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Community Based Participatory Research (CBPR) can facilitate the collection of nuanced, community-specific data needed to develop appropriate, community-relevant strategies to tackle disparities, while simultaneously empowering communities (Wallerstein & Duran, 2006). CBPR is asset-based and stresses the importance of valuing existing community knowledge, relationships, strengths and resources. In addition, engaging community members and agency stakeholders in the research process, from design and planning to implementation and dissemination, may also facilitate efforts to translate research into action by creating common ways of discussing and understanding the findings (Sprague Martinez, Ndulue, & Peréa, 2011).

CBPR is not without its challenges; utilitarian approaches and power imbalances may hinder engagement (Cacari-Stone, Wallerstein, Garcia, & Minkler, 2014). Furthermore, communication barriers associated with disciplinary jargon can create tension among academic and community stakeholders (Martinez, Russell, Rubin, Leslie, & Brugge, 2012). To surmount such challenges, research decision-making as well as study design, implementation, and dissemination should be inclusive and involve stakeholders representing multiple sectors of the community (Blumenthal, DiClemente, Braithwaite, & Smith, 2013; Hacker, 2013; Minkler, 2010).

Recently, there has been an increased focus on youth involvement in CBPR. Given CBPR's focus on engaging those traditionally left out of the research process (Leung, Yen, & Minkler, 2004; Minkler, Blackwell, Thompson, & Tamir, 2003; Minkler, Vasquez, Chang, & Miller, 2008; Wallerstein & Duran, 2006), a focus on youth is relevant as they represent an often overlooked population in intervention research. The benefits of effective engagement of youth in research, as well as local community development and health initiatives, have been well documented. Youth bring a fresh perspective, outlook and interpretation (Zeldin, Christens, & Powers, 2013). Working in collaboration with them may reduce the risk of adult-centered interpretations of youth themselves and the contexts in which they live, by allowing scientists to capture and incorporate their subjective interpretations in the design of community-based programs (Chan, Carlson, Trickett, & Earls, 2003). In addition, engaging young people as partners may contribute to their optimal health and development, as well as their ability to engage in community change and empowerment efforts. (Sangalang, Ngouy, & Lau, 2015). More importantly, they benefit from leadership and professional development opportunities, such as those provided by community-engaged research, because it can help them develop into civic-minded, healthful, and caring adults (Delgado, 2006). Ultimately, communities can benefit from programs that raise critical consciousness among young people, because it is central to empowerment on both individual and community levels (Ferrera et al., 2015).

We present an illustrative case study of a critical service-learning intervention focused on health equity and action for middle school aged youth of color attending a public school in Boston, MA, that was developed by a youth engaged CBPR partnership. Critical service-learning provides students with the opportunity to engage in experiential learning linked to their personal experiences with oppressive conditions (Delgado, 2015). Critical service-learning is experiential learning steeped in social justice (Wang & Rodgers, 2006). Students take on the role of change agent and service provides a vehicle by which they

can wrestle with and respond to inequity in the community (Mitchell, 2008). Here service was health equity research and action. More specifically, the intervention, Nuestro Futuro Saludable (NFS), employed applied inquiry and critical dialogue in an effort to engage low-income youth of color in an exploration of local health inequities and public health action.

This paper describes the benefits of community practice with young people of color. It adds to the service-learning literature overall, in that here research is conceptualized as service. More and more diverse community stakeholders are partnering with researchers seeking to address health inequity (Leung, Yen, & Minkler, 2004; Minkler, Blackwell, Thompson, & Tamir, 2003; Minkler, Vasquez, Chang, & Miller, 2008; Wallerstein & Duran, 2006). This provides an opportunity to engage youth in research as service for community change. This case study demonstrates the transformative power of working within the context of the *funds of knowledge* or life experience urban youth of color bring (Basu & Barton, 2007). Youth insight informed researcher and community partner perspectives and significantly shifted youth perceptions of their ability to make community change. We present the NFS intervention and methods as well as the process of implementing it. We then describe lessons learned and discuss the benefits of youth participation in critical serivce learning focused on health inequity.

Nuestro Futuro Saludable (NFS)

NFS was a grant proposal submitted in response to a National Institute of Minority Health and Health Disparities call for CBPR proposals to tackle health disparities. Readers should note that neither the area of intervention nor the intervention itself was established prior to receipt of the funding award. A steering committee (SC) made up of Boston-based academic researchers from the fields of social welfare policy, public health and environment health, civil engineering and nutrition and diverse stakeholders representing a community health center, health equity organization and Latino health institute as well as the local health commission's Center for Health Equity and Social Justice convened a community advisory board (CAB) to determine the intervention focus. The only parameters set by the SC were that the intervention focus on community level factors, more specifically the deleterious effects of the built environment, that impact of the health and well-being of Caribbean Latino (Dominican and Puerto Rican) youth ages 16 to 24 in Boston's Jamaica Plain neighborhood (Sprague Martinez et al., 2011).

The SC convened a CAB comprised of local providers and organizers who work with Caribbean Latino youth and parents from the Jamaica Plan neighborhood. The CAB received training and engaged in activities designed to facilitate group cohesion (Ndulue, Perea, Kayou, & Martinez, 2012). Initial training was focused on health equity, the determinants of health, CBPR and research ethics. The SC conducted primary data collection (key informant interviews with youth and providers) and compiled secondary data. Data collected were recorded and transcribed. Two members of the research team reviewed a sample of the transcripts and identified key themes. A codebook was developed based on the themes. Research team members then applied the codebook to the transcripts, after which they met to reconcile the codes. Data themes were organized ecologically and

presented to the CAB who then, during a series of meetings, analyzed the relationship between the themes and reflected on the data in the context of community conditions, which included gentrification, displacement and changing neighborhood demographics (Sprague Martinez et al., 2011). This process is illustrated in *image 1: CAB analysis of data themes*.

After exploring the relationships between key themes present in the data, the CAB considered potential intervention areas including housing, mental health and education and explored existing community resources that would support intervention uptake. CAB members worked in small groups to identify potential interventions, while SC members worked to identify evidenced-based strategies in the literature in line with intervention concepts important to the CAB (Sprague Martinez, et al., 2011).

The NFS CAB identified psychosocial stress ("stress" hereafter) as a priority area and the focus of our intervention. More specifically, the CAB decided that elements of the social context that surrounds the built environment such as racial inequity exacerbate chronic stress (Schulz & Northridge, 2004; Sprague Martinez et al., 2011). The CAB intervention planning process and the community context is described in detail elsewhere (Sprague Martinez et al., 2011). The CAB and SC designed a critical service-learning intervention focused on the social determinants of nutrition, physical activity (PA), and stress.

In the end, the CAB rejected the SC framework focused on youth ages 16 to24 and refocused the intervention on middle school students (aged 11–15). Youth CAB members were between the ages of 16 and24, and felt young people needed to be engaged earlier and that there were limited opportunities for middle school students. In addition, because the CAB designed a school-based intervention, the research focus shifted from Caribbean Latino youth to diverse youth of color, reflecting the population of the school selected for the intervention.

Nuestro Futuro Saludable: A school-based intervention

The intervention targeted middle school students in Boston's Jamaica Plain neighborhood. It was offered as a 10-week afterschool program, delivered five days a week for approximately 80 minutes a day. The CAB was interested in an intervention rooted in empowerment, which would provide middle school students with a "safe space" to grapple with or reflect critically on the social determinants of health in their community. The intervention was based on the assumption that students are aware of health inequities as well as the factors that produce and sustain them, but that they lack a safe setting and, in some cases, the language to process them. It was steeped in popular education (Freire, 1970), which relies on critical pedagogy, a focus on learner empowerment that exists in response to the inequities of our society (Freire, 1970). Learners are inspired to reflect, challenge and take action to tackle injustice, becoming agents for change in their community (Luque et al., 2011). An additional underlying assumption was that engaging youth in critical service learning focused on health equity might increase civic engagement and self-efficacy and potentially reduce stress (Watts & Flanagan, 2007). CAB and SC members anticipated that feelings of empowerment and self-efficacy may reduce stress by giving the youth a sense of control over their external environment. As such, the focus was on the effects of participating in the intervention on:

(1) increasing active and engaged citizenship; (2) increasing knowledge and awareness of the social determinants of nutrition physical activity and stress; and (3) decreasing stress among intervention participants. In addition, as a pilot intervention we sought to refine the curriculum and associated activities as well as to establish best practices for youth engagement and data collection procedures.

Pedagogy

Unlike traditional didactic behavioral interventions, NFS students engaged in critical service learning that involved applied inquiry focused on health and health equity coupled with critical discourse. Applied inquiry allows students to take an active role in the learning process, challenging them to question as they explore and grapple with the evidence they seek (Brewer & Daane, 2002). Applied inquiry is different from traditional learning, as it recognizes and leverages student experiences and preconceptions about the world and how things work, allowing them to seek evidence and devise solutions to support their reasoning (Gibson & Chase, 2002). Inquiry-based education and conceptual understanding is rarely emphasized in urban public school settings where learning is not always connected to the broader neighborhood context in which young people operate (Basu & Barton, 2007).

The NFS CAB was not interested in what they referred to as a traditional public health intervention, focused on top down education and behavior change. Accordingly, the intervention was rooted in critical pedagogy, which is focused on learner empowerment. Empowerment education encourages learners to take a more active role in their own education, while simultaneously encouraging them to become agents for change in their community (Luque et al., 2011). Critical pedagogy emphasizes co-learning, aims to reduce power dynamics and assures all voices are valued (Matthews, 2014). Here students and facilitators collaboratively engaged in community assessment, data collection and analyses. They explored racial inequity and challenged the dominant narratives that frame their lived experience. It was expected that critically engaging with health information and data would promote consciousness raising and transformative social action (Matthews, 2014). This approach fit well with our overall CBPR framework, creating flexibility in the curriculum for youth to shape discussions based on what they were finding during data collection and analyses.

Facilitation and training

The CAB was particularly concerned about who would deliver the curriculum to the students. They emphasized the importance of having what they deemed authentic and successful young adults of color as facilitators so that students would relate well to them. CAB members defined as authentic staff from the community or people with close ties to the community. They were specific in that they did not want a staff made up solely of affluent, white graduate students. Project staff members, in contrast, were concerned about the ability of facilitators to understand and explain the social determinants of health and health disparities as well as make sense of ambiguous local data. As a result of the persistence of the CAB, the research team contracted with a local youth worker trusted by the CAB who had extensive experience developing and managing after-school programs. A diverse group of facilitators was recruited, screened and hired, including but not limited to

Master's level teachers, youth workers, coaches and high school students, who ranged in age from 16 to 28 years. Younger (junior) facilitators were paired with older (senior) facilitators.

Facilitators attended a 3-week training course (approximately 30 hours) that provided a basic understanding of health disparities, the social determinants of health, and the relationship between nutrition, physical activity and stress. The training included viewing *Unnatural Causes* (Adelman, 2008), as well as presentations by Steering Committee, project staff members and local stakeholders about health inequities in Boston. Facilitators also received instruction to enhance their skills at delivering the curriculum as well as facilitating icebreakers and games, and providing effective classroom management. The training was hands-on with participants taking turns at facilitating lessons and discussions. Beyond the initial training facilitators took part in weekly meetings, during which they received support related to implementing the curriculum and managing group concerns.

Project site

The intervention was implemented in a Boston public school serving Kindergarten (K) through 8th grade students from the Jamaica Plain, Roxbury, Dorchester and Hyde Park neighborhoods of Boston. At the time of the intervention, K through 5th grade population was demographically quite different from the grade 6–8 population. Many of the students who attend the lower school leave after grade five to attend exam schools. Because of this, the lower school had a higher percentage of white students, and a lower percent of students who qualified for free and reduced lunch. Of NFS parents interviewed, only 3 of 68 reported that their child attended the lower school. The majority of the middle school (6–8) population identified as Black or Latino. At the time of the intervention there were 311 students enrolled in the school, 74% of who qualified for free (66.7 %) or reduced (7.3%) lunch.

Student recruitment

A two-step convenience sampling strategy was used to identify students. First, students were invited to apply (see below). Once an initial group of students was identified, we used quota sampling to ensure gender and race/ethnicity were closely in proportion to their prevalence at each grade level (6–8th) (Chambliss & Schutt, 2013). Our recruitment strategy was highly informed by CAB input as to what would be most effective for this population. CAB members emphasized that the program be youth-friendly and the importance of distinguishing program activities from school time. This process is described in the sections that follow.

In order to recruit students, the CAB identified a local high school student skilled in graphic design to develop a youth-centric flyer. The flyer was printed on a glossy postcard, much like flyers printed for nightclubs and party events and incorporated colors taken from the Dominican and Puerto Rican flags. A sample flyer can be seen in Figure 1 : *Program Flyer*. In addition to the flyer, a large recruitment poster was designed for display in the guidance counselor's office. Letters were sent home to parents describing the study as well as an initial permission slip. In addition, we set up a Gmail account and obtained a Google

phone number, which allowed students and parents to text the project directly or call for information. Inquiries were automatically forwarded to team email accounts for follow-up.

Working with the guidance counselor, we identified students seen as leaders among their peers to promote the intervention across each grade level. On the day the flyers were distributed, CAB members and research assistants visited eligible classrooms to talk about the study with students. Of note, the racial and ethnic make-up of both the CAB and research team was reflective of the student population and presentations were made in English and Spanish, the two main languages spoken by students. Moreover, CAB members included youth. Within two weeks of the initial announcements, 90 of the 311 students enrolled in the middle school submitted applications. Of the 90 students 68 were enrolled in the intervention. Sixty-eight youth enrolled in the intervention, 32 girls and 36 boys. However, participation posed a number of challenges for some students who had afterschool commitments. Based on discussions with school staff members and the program manager log we believe this was due in part to the fact that the intervention started in January and many families identify and commit to afterschool activities in the fall. Additionally, some students were responsible for younger siblings. In these cases, we were able to work with the lower school afterschool program director, who subsidized spaces for siblings of program youths.

Program schedule and curriculum

The intervention was conducted Monday through Thursday after school from 2:30 to 5:00 pm. Youth were divided into four groups based on age and grade. Each group was assigned a male and female facilitator, who delivered the curriculum together. During the first 40 minutes, students were provided with a snack and worked on their homework. During this time they received academic support from the intervention facilitators and program staff members. The remaining time was dedicated to the intervention curriculum.

The program curriculum consisted of four units, as well as a precurriculum unit designed to build unity among the young people and intervention staff. Figure 2 provides an overview of the curricular model. The precurriculum was focused on teambuilding and group processes (Ndulue, Perea, Kayou, & Martinez, 2012). This unit stressed teamwork, making it possible for students to experience the power of working on projects in groups. An additional goal was to shift students' perceptions from being accountable only to teachers and adults to being accountable to each other and their community. Youth engaged in activities daily and developed a working agreement/contract.

During unit one, youth were introduced to key concepts related to the social determinants of health, physical activity, and nutrition. They explored examples of these concepts in their own lives and in the context of their community. Unit two introduced students to the concepts of gentrification, eviction and neighborhood violence through a health lens. They studied the social history and demographic trends in the Jamaica Plain neighborhood. They were also introduced to map reading and using maps to display health data. Building on the concepts explored in unit one, students explored the relationship of social forces and health behaviors. Additional topics discussed included housing conditions, policing, environmental hazards and financial insecurity. Many of these issues students experience in their every

day lives, so much of our work involved providing language and history to allow students to engage in critical conversations about them. Once they had a deeper understanding of the key concepts, students conducted community health assessments in unit three. This allowed them to systematically explore issues they were studying. Youth conducted spatial and evironmental assessments of elements of the built environment. They used audit tools as well as well as obeservation and photovoice. Youth analyzed their data with the support of group facilitators, critically reflecting on their findings in the context of their school and the broader community as well as in the context of their own personal experiences. The final unit was focused on dissemination. Youth made recommendations based on their analyses and reflections. They presented their results to the broader school community and local stakeholders. In addition, recommendations for improving health and addressing health inequity were made to local public health leaders.

Program Activities

Program youth were divided into four sections, each of which worked with two facilitators. Sections participated in curriculum activities related to skills-based trainings, meetings with local health professionals and researchers of color, field trips, photovoice, community assessment, and a capstone presentation to promote dissemination and local advocacy (Sprague Martinez et al., 2012; Sprague Martinez et al., 2011). Over the course of the intervention, youth collected and analyzed data and prepared materials for dissemination based on their findings. Materials included short movies and CDs, research posters, models and maps, photo essays, press releases, letters to local officials and summary reports. Activities were aimed at developing critical consciousness, engaging youth in dialogue and using knowledge to empower the youth to make change in their community (Freire, 1970). Students received a monthly stipend of $200.00 for their work.

Research Methods

The study protocol was approved by the Tufts University Social Science Behavioral and Educational Research Institutional Review Board. Beyond engaging youth civically, increasing knowledge related to the determinants of health and reducing stress, we set out to capture best practices in order to refine recruitment and data collection procedures, as well as curriculum content. A pre/post-test survey design was employed for youth participants, as well as an initial parent interview. Stress biomarkers and food frequency data collection procedures were also piloted with a subset of the intervention population. In addition, qualitative interviews were conducted with facilitators, and products developed by students as well as staff notes and meeting minutes were analyzed thematically. Table 1 describes each of the surveys, as well as the data collection time points.

Parent interviews were required for enrollment and could be scheduled at the school, home, health center or at a local non-profit organization. A total of 69 parents participated in the initial interview and provided parental consent for their children to take part in the intervention. Of the 69 parents, all but four opted for a home visit. Initial parent interviews were conducted in either English or Spanish over a two-week period prior to the start of the intervention. Parental consent for children's participation was obtained during the

initial interview. Written assent was obtained from youth who agreed to participate in the intervention at the onset of the intervention. Pre- and post-test surveys were administered during the first and last weeks of the intervention. Program staff members administered surveys to youth in groups of four and five. The survey took approximately an hour and a half to complete. Sixty-eight students completed the initial survey and 40 students completed the follow-up survey. All data from the intervention surveys were double-entered into an Access file and cross checked for errors to assure accuracy. The McNemar test was used to compare 2×2 tables of pre- and post-test responses on the youth survey, while Bowker's test of symmetry was used to compare pre- and post-test responses for items with two or more possible responses. Analyses were run in SAS 9.3 (SAS Institute Inc., 2011).

Facilitators participated in interviews prior to the onset of the intervention and at follow-up. Consent was obtained from facilitators during the orientation and training phases of the project. Research assistants and undergraduate interns conducted observations over the course of the intervention and facilitators maintained weekly logs. In addition, the grant manager kept a running record of the intervention; this, as well as all meeting minutes, youth activity binders and youth dissemination products were analyzed thematically at the culmination of the intervention by the study investigators, with the support of research assistants.

Intervention Findings

Among the youth participating in the intervention, 63% reported Hispanic ethnicity. The most commonly reported race was Black followed by White, and Native American, 27.94, 16.18 and 1.47 percent, respectively. The remaining 54.41% either left the question blank or selected other or don't know. The race question proved difficult for both parents and youth. Racial and ethnic identities are complex concepts not easily captured by standard Census categories. In our sample, many youth reported Latino as their race, although it is considered an ethnic category in the United States. Latino ethnicity is itself a broad term which does not necessarily reflect individual identities. This is especially relevant for families who immigrate to the US and are confronted with the ethnicity category for the first time. For example, Latino ethnicity although used in the United States is not used in Latin America or the Caribbean (Rodriguez, 2003). Furthermore, racial categories in the Dominican Republic and other countries are not the same as those used in the US. For example, an individual in the Dominican Republic identifying as indio o indio oscuro, might be enumerated themselves as Black in the US (Duany, 1998). The meaning of Black is thus quite different in the Caribbean than it is in the US (Duany, 1998).

In order to understand youth community engagement and perceptions of their ability to make change in the community, it was important for us to explore how young people conceptualize community. As such, youth were asked a series of questions about their "community" and how they defined community. Table 2 displays examples of youth responses to place-based and population-based definitions of community. Youth were asked to select from a list of responses that best describe "their community;" youth could select multiple responses and write-in additional responses. Students selected between zero and four population-based responses and between zero and seven place-based responses. The

overall range was from zero to 11. Additional responses included states and towns outside of Boston as well as countries.

We found that youth defined their community in terms of both place and population. Place-based responses were most commonly neighborhoods, while population based-responses were Black or Latino, as well as Dominican and Puerto Rican. Although we anticipated variation in youth responses, we expected most youth to report the school as their community. However, this was not the case for youth taking part in the intervention. The literature indicates younger students have a stronger sense of community within their neighborhoods and schools, which decreases as they age, suggesting that they feel "less connected and have less opportunities to influence" these spaces (Evans, 2007; Pretty, Andrewes, & Collett, 1994; Pretty, Conroy, Dugay, Fowler, & Williams, 1996). Perhaps NFS youth experienced less connected to their school community because they have few opportunities to influence it. The high level of interest and participation in NFS among students may suggest that they were seeking opportunities to engage in the school community, and would take advantage of outlets designed to allow them to influence that community.

There were 28 questions on the student survey that measured knowledge related to nutrition and physical activity as well as their determinants. Students demonstrated a statistically significant improvement in knowledge, based on a mean knowledge score, which increased from 63 to 69.6 ($p = <.01$). However, further research is needed to determine the extent to which this increase in knowledge held over time, as well as the extent to which it may or may not have influenced actual youth practices related to nutrition and physical activity.

Youth were asked if they have the skills to make changes in their community. Fifty-two percent of students agreed pre/post with the statement, "Doing something to help others is important to me". However, a borderline-significant ($p=0.08$) number of students (21%) changed responses from agree to disagree, pre/post. A similar negative pattern was true for the statement, "It is possible for people to improve the world they live in". Seventy-four percent of students agreed pre/post and 18% of students moved from agree to disagree ($p=0.03$). Whereas in response to the statement, "I have the skills I need to make changes in my community", 42% of students agreed pre/post. Thirty-three percent of students changed their responses positively from disagree to agree ($p=0.02$). While this pattern suggests a possible influence of empowerment among youth, we did not conduct analyses to examine scale properties.

Our findings suggest students benefited from participating the 10-week NFS intervention. However, an apparent paradox was evident in a discrepancy between student responses to community engagement. One of the most statistically significant changes identified between the beginning and end of the intervention was student's positive response to the item, "I have the skills I need to make changes in my community." However, there was some negative change in empowerment measures, such as perceptions of the ability to improve the world. We posit that while the intervention itself aimed to increase awareness, some of the information may have been overwhelming for youth to process in a relatively short time frame. While students could acknowledge that they had gained some concrete skills related

to health assessment, advocacy, and public health as part of the intervention, they also recognized the existence of constraints governing how these skills could be implemented in the community.

By validating their life experiences and providing them with language, skills and space for critical reflection we found that youth developed a broader understanding of the local forces that shape decision-making, which was evidenced by their recommendations. Examples highlighted by local media included, *Make all neigborhoods equal and safe; We need healthy, low-priced food that people can afford; Clean our streets too, not just the white part of the community.* Their assessment findings, related to local sanitation, were published by the *American Journal of Public Health* and highlighted neglect in urban communities of color; as well as the disconnect between adult researchers and youth with respect to health concerns (Sprague Martinez et al., 2012). Adults involved with NFS were transformed while youth became civically engaged around issues of health and health equity in the community. Advisory board members and facilitators, alike began to discuss healthful behavior as a form of resistance against the oppressive racialized structures surrounding them during advisory board and team meetings.

Lessons Learned

Community advisory board (CAB) process

We learned a number of lessons during the course of this project. Youth involvement was important on the CAB that developed this intervention. CAB youth redirected the intervention to focus on middle school youth, a significant revision of the original plan. As researchers and adult stakeholders we may have thought the content not appropriate for this age group, but given youth participation and products we found that this was an effective intervention for 6th to 8th grade students.

Youth CAB members, in addition to facilitators reviewed curriculum lessons and activities before implementation to assure that they were relevant for the target population. They also supported the development of recruitment materials and procedures and assisted with recruitment itself. Most importantly, youth on the CAB challenged adults and advanced our thinking about best practices for health interventions targeting young people. Although there were youth on the CAB, they were high school aged. This was largely because our initial intention was to target older youth ages 16 to 24. Through reflection some CAB members decided that having middle school students from the target school involved with the development of the curriculum and program intervention might have increased participation. In addition, greater middle school youth involvement in the curriculum development could have made prompts and activities more meaningful.

Intervention implementation

Through a combination of document review, observation and facilitator interviews we determined the relationships between students and facilitators were key elements associated with program engagement. In cases where youth were unhappy with programmatic activities, facilitators were able to motivate and engage them. The CAB informed facilitator

hiring and determined the characteristics of an "ideal facilitator". Facilitators were not health educators. They were youth workers, community college students, and local high school students. In one case, a facilitator had a degree in education, but none had formal public health or health education training. However, they were all relatable and could easily find common ground with students, were committed to racial equity and believed in the strengths of the youth. Furthermore, all intervention staff members as well as lead investigators were people of color committed to racial justice and health equity. Moreover, our CAB partners used a racial justice framework in their everyday work. This set the tone for the project and intervention, as such youth found themselves in a space in which challenging dominant narratives, cultural hegemony and institutionalized racism was the norm.

Intervention

Observations and facilitator interviews indicate, setting, structure and group size all influenced the outcomes of the program intervention. The program intervention was held on site after school. There were many conversations with the CAB as to whether or not the school was the ideal place for the program intervention. Stakeholders did not want the intervention to feel like school, and were concerned that negative dynamics present during the school day might carry into the afterschool activities. As such, we worked to create our own climate. We began with team building and worked to create community, as well as to infuse an NFS identity. Students had research assistant ID badges with the university logo and were on a first name basis with their facilitators. The groups were divided, each with two facilitators to keep the staff/student ratio low, which helped foster conversation and expression among participants as facilitators were able to be accessible and available.

Dissemination

We had a well-attended capstone presentation, which was attended by the middle school population as well as local organizations and parents at the end of the program, integrating meaningful opportunities for dissemination and action throughout the program. Still, there could have been ways that the intervention may have further increased perceptions of ability to make change in the community. For example, structured face time with local policymakers or consistent communication with local media might have provided additional valuable opportunities. In addition, better integration may have increased parent engagement throughout the program intervention. Earlier, more consistent dissemination and the youth capstone presentation represent opportunities to connect all interested stakeholders, and these networks could be further strengthened to develop more meaningful relationships in the future. Fostering these connections and linking youth to resources that enable them to act, such as working to establish strong connections with community leaders, may have improved our outcomes.

Intervention outcomes

A key premise underlying this intervention was that engaging youth in an exploration of the social determinants of health in their communities coupled with local advocacy and health promotion would increase civic engagement. While students could acknowledge that they had gained some concrete skills as part of the intervention, they also recognized the existence of constraints governing how these skills could be implemented in the community.

NFS provided a common language to identify social determinants of health. However, the short time frame of the intervention, just 10 weeks, may have limited substantial opportunity for students to practice implementing those skills.

The intervention was not without challenges. The level of academic preparedness varied across students; many were below grade level, which required tailoring lessons and breaking concepts down into smaller topics. Similarly, the historical context related to the health and well-being of communities of color was entirely new to students. Despite these factors, we found the students rose to the challenge and engaged with the materials. We believe this was largely associated with the flexibility of the facilitators who had high expectations for students and met them where they were both academically and emotionally. In addition, the applied nature of the program intervention, the content, and the small youth-facilitator ratios facilitated success among the youth, as did the strengths-based team approach that allowed students to design materials to demonstrate their learning that spoke to the strengths of the team.

The benefits of youth engagement in critical service learning

The benefits associated with critical service-learning have been well documented for students, adults and the broader community (Delgado, 2015). We found the benefits of engaging youth in critical service-learning framed as public health research and action to be numerous. The lived experience of youth is validated when their perspectives are included (Kinloch, Nemeth, & Patterson, 2014). Youth engaged in the NFS program intervention were well aware of the inequities in the community surrounding their school. They talked openly about "the two Jamaica Plains", one that was White and affluent and the other that was Black, Latino and poor. However, they were unaware of the historical-political factors, such as racialized housing and education policy associated with what they were experiencing, and in most cases could only describe the current circumstances. Reflecting critically on the broader determinants of health, and learning about historical factors that contributed to the construction of present day neighborhood conditions allowed youth to look beyond individual-level factors such as diet and exercise that contribute ill health, and to question broader community-level factors that influence decision-making and life chances.

Meaningful youth involvement facilitates the work of community research partnerships, as youth partners bring a nuanced understanding of the assets and priorities young people have and the changes that would benefit them (Zeldin, Christens, & Powers, 2013). Having youth on the NFS community advisory board held us accountable, with respect to exclusionary language and adult centered assumptions. Early in our process we were challenged by both youth and community stakeholders about the "academic lexicon", and how language can be used as a tool to exclude and alienate, despite good intentions. As such, we developed a strategy for confronting language barriers, which led to the development of a project dictionary inclusive of "youth" and "academic" terminology (Sprague Martinez et al., 2012; Sprague Martinez et al., 2011). In addition, through program activities and assignments we found youth in the NFS program intervention conceptualized neighborhood health risks differently from their facilitators, project staff members and investigators during their

community assessments, honing in on sanitation as a primary concern (Sprague Martinez et al., 2012).

Engagement can give agency to youth who are often marginalized, and allow them to express their strengths and expertise (Checkoway & Gutierrez, 2006). Engaging youth in community programs provides them opportunities to connect collaboratively and clarify their own identities. In addition, youth can provide a fresh perspective (Checkoway & Gutierrez, 2006). Youth in the NFS program intervention engaged whole-heartedly in the program, taking risks and sharing their views openly. They developed health messages that were presented in videos, animation, and songs and as more traditional research posters. In addition, they presented their findings to local public health officials, community stakeholders, their families and peers at a capstone presentation event when the program was complete. Allowing youth to work in teams, drawing on their strengths to develop strategies to advocate for health in their community piqued their interest and empowered them to express their views. Youth came to the event confident and dressed professionally as they took pride in their work and in sharing what they were learning with the broader community.

Finally, through our work with the youth and the CAB we began to understand health as a tool to resist the "web of racism" that weighs heavily on Black and Latino communities in the US (Miller & Garran, 2008). CAB members, youth facilitators and program youth championed the notion of engaging in healthful behavior as an act of resistance against oppression, namely racism. Most health education is top down, dictating behaviors that are deemed acceptable by the white middle class. By creating a space for critical reflection on racism, the racial hierarchy and health, achievement and healthful behavior became a way to resist racist structures embedded in the community.

Limitations

Findings associated with NFS are limited due to the scope of the intervention. The primary limitation was the timeframe of 10 weeks, which makes it difficult to attribute changes in the students to the curriculum itself. Additionally, as a pilot designed to explore the feasibility of a full-scale trial we did not include a comparison group of matched students. The work was focused in the Jamaica Plain neighborhood and thus may not be generalizable to other communities.

Conclusions

Overall, we found that young people of color who took part in the intervention were knowledgeable about the social determinants of health in their communities, as well as the barriers to health. Based on our findings, we believe engaging local youth in a meaningful way will be critical if health improvement is to be realized. Youth are valuable assets with respect to their social ties within the community and their possession of knowledge of cultural and social norms, and useful creative energy. Engaging them as equitable partners in the planning, design, implementation and evaluation of public health interventions, which seek to decrease health inequity, may yield increased intervention uptake, and enhance the support and sustainability of the intervention.

A key lesson from this intervention is the critical service-learning framework in which it was conducted. We used a strengths-based youth engaged framework that incorporated elements of applied inquiry, critical pedagogy, advocacy and organizing. This framework was effective as a public health intervention and provided opportunities for community engagement. Young people can provide valuable perspective and should be offered tools to promote health equity while gaining research experience. Future youth engaged and initiatives designed to promote health should further explore opportunities for critical service-learning.

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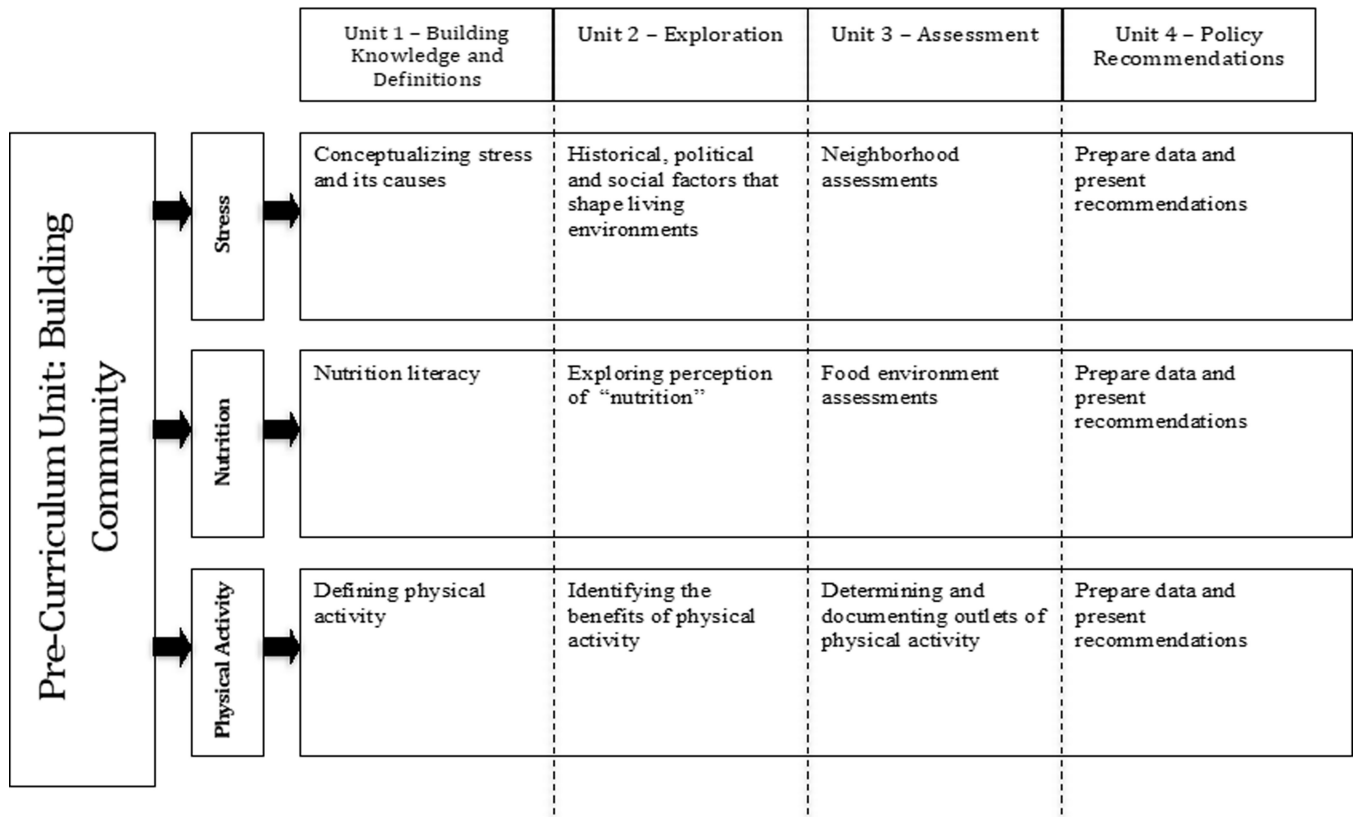
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Figure 1:
Program Flyer

	Unit 1 – Building Knowledge and Definitions	Unit 2 – Exploration	Unit 3 – Assessment	Unit 4 – Policy Recommendations
Stress	Conceptualizing stress and its causes	Historical, political and social factors that shape living environments	Neighborhood assessments	Prepare data and present recommendations
Nutrition	Nutrition literacy	Exploring perception of "nutrition"	Food environment assessments	Prepare data and present recommendations
Physical Activity	Defining physical activity	Identifying the benefits of physical activity	Determining and documenting outlets of physical activity	Prepare data and present recommendations

Pre-Curriculum Unit: Building Community

Figure 2:
Curriculum Overview

Table 1:

Data Collection Schedule approximately here

Procedure	Measures	Pre	Post
Student Survey	**School Physical Activity and Nutrition Questionnaire, Youth Media Campaign Longitudinal Study Behavior** (Hoelscher et al.; Potter, Judkins, Piesse, Nolin, & Huhman, 2008). **Perceived Stress Scale** (**PSS**) (Cohen, 1988). **Adolescent Life Events Questionnaire:** (Hankin & Abramson, 2002) **2010 Census Questions** (U.S. Census Bureau, 2011). **Youth Adaptation and Growth Questionnaire** (Portes & MacLeod, 1996) **Civic Responsibility Survey** (Furco, Muller, & Ammon, 1998).	✔	✔
Parent Interview	**Census, adapted questions from Youth Adaptation and Growth Questionnaire** **Center for Epidemiological Studies Depression Scale-CES-D** (Radloff, 1977). **PSS** (Cohen, 1988). **Life Events Questionnaire:** (Norbeck, 1984; Sarason, Johnson, & Siegel, 1978). **Healthy Home Survey:** (Bryant et al., 2008).	✔	
Student Salivary Cortisol	Stress	✔	✔
Student Food Frequency Questionnaire	Average nutrient intake		✔
Facilitator interviews	Program perceptions, perceptions of student participation and engagement	✔	✔
Program Observations	Interactions and engagement	Continuous	
Student Portfolio & Product Review	Participation, knowledge, engagement	Post intervention	
Document review: facilitation session notes, meeting minutes and staff log	Program processes	Post intervention	

Table 2:

My Community

Population-based responses		Place-based responses	
Latinos	45.59%	Boston	50%
Puerto Ricans	33.82%	Roxbury neighborhood	42.65%
Dominicans	45.59%	Hyde Park neighborhood	19.12%
Blacks	48.53%	Jamaica Plain neighborhood	44.12%
		Roslindale neighborhood	35.29%
		Dorchester neighborhood	35.29%
		The Curley School	58.82%