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### Growing Vegetables and Values: Benefits of Neighborhood-Based Community Gardens for Youth Development and Nutrition

Julie Ober Allen <sup>a</sup>; Katherine Alaimo <sup>b</sup>; Doris Elam; Elizabeth Perry

<sup>a</sup> Department of Health Behavior & Health Education, University of Michigan School of Public Health, Ann Arbor, MI <sup>b</sup> Department of Food Science and Human Nutrition, Michigan State University, East Lansing, MI

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## ORIGINAL RESEARCH

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# Growing Vegetables and Values: Benefits of Neighborhood-Based Community Gardens for Youth Development and Nutrition

Julie Ober Allen, MPH  
Katherine Alaimo, PhD  
Doris Elam  
Elizabeth Perry

**ABSTRACT.** Community gardens are one way that residents have mobilized to beautify urban neighborhoods, improve access to fresh produce,

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Julie Ober Allen, MPH, Department of Health Behavior & Health Education, University of Michigan School of Public Health, Ann Arbor, MI (E-mail: joallen@umich.edu).

Katherine Alaimo, PhD, Department of Food Science and Human Nutrition, Michigan State University, East Lansing, MI (E-mail: alaimo@msu.edu).

Doris Elam, 1101 Royal Court, Flint, MI 48532.

Elizabeth Perry, 3219 Old Farm Rd, Flint, MI 48507 (E-mail: J1L2Perry@aol.com).

Address correspondence to: Katherine Alaimo, PhD, Department of Food Science and Human Nutrition, Michigan State University, 302C G. M. Trout Building, East Lansing, MI 48824-1224 (E-mail: alaimo@msu.edu).

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and engage youth. Qualitative case studies were conducted of two neighborhood-based community gardens with youth programs. Data collection included participant observation and in-depth interviews with adult gardeners and neighbors, youth, and community police officers. Results suggest that the garden programs provided opportunities for constructive activities, contributions to the community, relationship and interpersonal skill development, informal social control, exploring cognitive and behavioral competence, and improved nutrition. Community gardens promoted developmental assets for involved youth while improving their access to and consumption of healthy foods.

**KEYWORDS.** Community gardens, urban agriculture, youth developmental assets, nutrition, qualitative research

## INTRODUCTION

Growing up in urban poverty can profoundly affect the health, well-being, and development of children and adolescents. Youth living in impoverished neighborhoods are more likely than their peers living in more affluent communities to experience physical and mental health problems, a poor-quality diet, an unhealthy body weight, academic difficulties, challenges obtaining gainful employment, delinquency, and criminal activity.<sup>1-4</sup>

Although individual and family factors play substantial roles in shaping the lives of poor children and youth, the social and physical contexts

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of their neighborhoods also affect their well-being. Many poor urban neighborhoods are plagued with physical and environmental hazards, violence, inadequate community services, and limited access to nearby resources that promote a healthy lifestyle, such as sources of healthy foods and safe places for recreation. In addition, many disadvantaged neighborhoods lack resident community involvement, shared values, mutual social support, and informal social control.<sup>5</sup> These deficits can facilitate the development of deviant and unhealthy behaviors, particularly among young people.<sup>5,6</sup>

Ellen and Turner<sup>7</sup> theorize that the potential impact of a neighborhood's context is most compelling during the adolescent years. Adolescents spend less time with their families and more time interacting with peers and other adults outside the home than younger children.<sup>8</sup> Additionally, adolescence is a fundamental period of identity development when youth begin to explore their individuality, test out adult roles, consider future opportunities and selves, and make decisions accordingly.<sup>9,10</sup>

Characteristics of neighborhoods' social and physical environments have been identified that are thought to promote youths' resilience despite the burdens associated with urban poverty and associated stressors.<sup>11-16</sup> The Search Institute,<sup>16</sup> for example, developed a list of 40 developmental assets divided among the categories of support, empowerment, boundaries/expectations, constructive use of time, commitment to learning, positive values, social competencies, and positive identity. Several of these assets suggest how community contexts and residents can provide youth with opportunities and support to explore developmentally appropriate tasks, avoid risk behaviors, and develop competencies that will help them succeed as they transition into adulthood.<sup>14</sup> Numerous studies have documented how various protective assets at the individual and family levels reduce youths' risks of undesirable outcomes and enhance their likelihood of engaging in "thriving" behaviors.<sup>14,15</sup> Little research, however, exists examining how characteristics of neighborhoods and neighborhood-based programs promoting youth assets can promote healthy youth development.<sup>13,15</sup>

Recent research findings on community gardens suggest that while improving neighborhood appearance and access to fresh fruit and vegetables, community gardens can also enhance neighborhood satisfaction, pride, and social capital and decrease fear of crime<sup>17-25</sup> (also K. Alaimo, J. O. Allen, T. Reischl, P. Hutchinson, and A. Atkinson, unpublished data, and K. Alaimo, T. Reischl, and J. O. Allen, unpublished data). Community gardens can also provide a neighborhood-based context with the potential to promote a variety of developmental assets while creating positive nutritional

environments for youth. Although there are few rigorous studies that have examined the outcomes of youth participation in community gardens, accounts suggest that youth benefit from paid employment opportunities, acquiring life skills, friendships, intergenerational relationships, and learning about gardening and nutrition.<sup>26,27</sup> Krasny and Doyle<sup>28</sup> found that youth involved in one community garden project developed gardening skills and knowledge, relationships with elder gardeners, academic skills, teamwork, responsibility, and appreciation for the value of gardens. There is also a growing body of research demonstrating that green spaces, such as community gardens, facilitate social interactions and the supervision and mentoring of children and youth.<sup>29,30</sup>

The city of Flint, Michigan, has struggled with economic hardship,<sup>31</sup> and its young people are at risk for many of the negative outcomes associated with urban poverty. This article describes a community-based participatory research (CBPR) project with community gardeners in Flint, Michigan, and explores how two neighborhood-based urban community gardens promoted youth developmental assets and nutrition.

## METHODS

Case studies were conducted with two community gardens in Flint with semiformal youth programs—the East Bishop/East Flint Park Block Club and Lakewood Village Block Club community gardens. These case studies derive from a larger CBPR project conducted through a partnership of the Prevention Research Center of Michigan at the University of Michigan School of Public Health, Michigan State University, the Flint Urban Gardening and Land Use Corporation (FUGLUC), and Flint's Neighborhood Violence Prevention Collaborative.<sup>17,25</sup> The study was guided by a diverse research committee composed of community leaders, community gardeners, neighborhood residents, and university researchers. Consistent with the principles of CBPR, it was believed that by engaging a diverse group of partners with a combination of research training and local knowledge and expertise, reciprocal transfers of knowledge would occur. This can build mutual capacity, empower participants, and produce high-quality, valid data that is relevant and useful for all involved.<sup>32</sup>

Data collection for this study included participant observation, photography, and interviews with youth, gardeners, other neighborhood residents, and Flint community police officers. The committee engaged in a collaborative

process to develop an open-ended, semistructured interview guide. The interview guide focused on broad questions exploring the structures, benefits, and challenges of community gardens as well as the roles individuals played in supporting the gardens in their neighborhood. The interviews, which ranged in length from half an hour to 2 hours, were conducted in person by members of the committee and university researchers and audiotaped. The majority of the interviews were one-on-one; however, a few small group interviews were also conducted with between 2 and 4 participants.

Comprehensive sampling frames of resident gardeners were developed for both neighborhoods based on the expertise of gardeners and leaders of the local neighborhood organizations. These were supplemented by less comprehensive catalogs of neighborhood residents. Key informants were identified using snowball sampling techniques and interviewed based on the convenience of arranging interviews with them. Interviews were conducted until the committee determined that theoretical saturation had been achieved. For this study, a total of 17 interviews were conducted with 15 community members, including 5 youth, in the East Bishop/East Flint Park neighborhood; 13 interviews were collected from 16 Lakewood Village residents, including 7 youth. Garden leaders and particularly insightful informants were interviewed twice, prior to and following the growing season. The youth who were interviewed were between 10 and 16 years old. Three additional interviews were conducted with 3 community police officers who worked in these neighborhoods. All the interviews occurred between March 2001 and February 2002. The interviews were complemented by written descriptions of block club meetings and gardening activities in which university researchers were participant observers.

Interviews were transcribed verbatim and entered into the qualitative data software program ATLAS.ti (Scientific Software Development, Berlin, 1998). The interviews and field notes were chunked into segments of text that represented distinct concepts that conveyed their original meanings apart from the context of the complete interview transcripts. Selected observations and interviews were reviewed in order to inductively ascertain recurring patterns and topics, which were developed into a standardized code book. Once the texts had been coded, 10% of the text was checked for coding comprehensiveness and inter-coder consistency.

During the iterative process of reviewing the texts, compelling indicators and themes of youth development emerged, suggesting a relationship between the participation of youth in neighborhood community gardens and their individual development. An organizational scheme was developed

that focused on the ways in which the community garden youth programs promoted developmental assets. Portions of the interviews were found to address the developmental assets of a constructive activity for youth, positive contributions to the community, relationships and interpersonal skills, informal social control, cognitive and behavioral competencies, and health through healthier eating. All the quotes, organized by asset, were examined, discussed, debated, and reexamined at numerous intervals throughout the process by the first and second authors. Community garden leaders from these two gardens who were also committee members reviewed the asset themes and corresponding quotes. This strategy was utilized to incorporate the insight and extensive knowledge of community gardens possessed by members of the study population, who critically analyzed, corrected, and further expounded on the researchers' analyses.

### *Descriptions of the Community Garden Programs*

The Lakewood Village and East Bishop/East Flint Park community gardens were both established in 1997 with grants from the Neighborhood Violence Prevention Collaborative, a program of the Community Foundation of Greater Flint, whose mission was to build the capacity of Flint community groups that were developing neighborhood-based violence prevention initiatives. These and subsequent grants were used to launch and sustain garden and beautification projects, as well as fund stipends for youth, mentors, and other youth-oriented activities. Both gardens were established in order to reduce dumping and other crimes in the neighborhood while concurrently improving the appearance of the community, providing access to free healthy food, and engaging local youth during the summer. The gardens were considered to be for the community, and all neighborhood residents were welcomed to participate in the collective care of the garden and in the harvest. A variety of vegetables were grown, as well as a few fruits, flowers, and decorative plants. In both communities, older residents played a major role in establishing, maintaining, and providing agricultural expertise for the gardens. These individuals often acted as supervisors and instructors for the youth and other adults working in the gardens, most of whom had never gardened before.

The Lakewood Village and East Bishop/East Flint Park community gardens had semistructured programs for neighborhood youth ranging from 6 to 16 years old. Approximately 16 youth participated in the East Bishop/East Flint Park community garden and 10 youth participated in the Lakewood Village garden during the data collection period, all of

whom were African American. For each garden, there was one primary adult supervisor and up to 3 other supervisors who worked with the youth during the growing season. The youth in each garden program participated in a variety of activities such as the clearing of the lots, cleaning the garden of trash, planting, weeding, watering, harvesting, mowing lawns for elderly in the neighborhood, planting flowers around the neighborhood, street clean-ups, and other block club-sponsored activities. The youth regularly interacted with the garden supervisors throughout the growing season and during the rest of the year.

The youth in Lakewood Village were not paid for participating in the community garden. The East Bishop/East Flint Park youth initially received stipends for their work in the community garden, but funding had ceased before the interviews were conducted and the youth were no longer being paid. Although some youth stopped working in the East Bishop/East Flint Park community garden once they were no longer being paid, about half continued to do so.

## RESULTS

### *Constructive Activity for Youth*

According to the results of the qualitative data analysis, the community gardens in both neighborhoods provided youth with a constructive endeavor to engage in. This was especially valuable in the summer time, when many of the children had a lot of free time and few recreational opportunities. Boredom and having nothing to do were frequently cited problems for children and teenagers in both communities. The adults, in particular, saw a connection between idleness and the frequency with which youth got into trouble. The gardens were viewed as a means of keeping the local youth busy with a positive activity. One adult explained, "I try to keep them involved [in the gardens]. That's our main purpose now, to keep these kids busy and keep them out of trouble. And we're doing a pretty good job."

### *Positive Contributions*

Additional analysis revealed that the community gardens also provided a context through which the neighborhood youth were able to make contributions to their community. They played a key role in transforming previously unused and unsightly lots into attractive green spaces that produced food for neighbors. The appearance of the community gardens



was a source of pride for many of the youth. One adolescent described the garden lot before and after she participated in cleaning it up: “It was mostly a big hill with trash and glass and stuff. When we first started out it was really, really difficult because we had all of that glass everywhere. . . . Now it is so beautiful.”

Several of the youth involved with the Flint community gardens articulated that they were involved in the gardens because they wanted to help make their neighborhood become a better place and to “make a difference.” According to one, “It’s better to go to the garden than staying in the house doing nothing, when you could be helping a lot of things to make big changes and everything.” One of the adults shared this story:

I heard this one [adolescent], he said something that really was impressive. He said that he felt like this was his neighborhood, and since he was the oldest one in the neighborhood, that he felt like it was his job to go out and do things and show the other, younger kids how to do things. . . . [He] helped me do a lot of stuff in the neighborhood. Actually he was the only teenage boy down there helping us in the garden. . . . He was the only one, and I think they kind of tease him a little bit about working in the garden. But he said this is his neighborhood, and he doesn’t mind helping out.

Contributing to the well-being of others was also discussed by more than half the young people interviewed, with particular emphasis on helping vulnerable populations like the elderly, the homeless, and the poor. Young people involved in the garden programs helped elderly neighbors maintain their yards and property and others brought them garden produce. The East Bishop/East Flint Park community garden program planted specific rows for donation to homeless shelters. Sharing foodstuff grown in the community gardens with those who needed it was mentioned by youth from both gardens. According to one adolescent, “What I like about the garden is that I like how it’s growing vegetables so like if people, like poor people come around here, they can pick the vegetables out of the garden and cook them.”

### ***Relationships and Interpersonal Skills***

Through their participation in the community gardens in East Bishop/East Flint Park and Lakewood Village, neighborhood youth were able to

spend time with their neighbors. Many interview participants described how the Flint community gardens brought together neighborhood residents who previously shared little in common and had little impetus to interact. When asked what the garden meant to her, one young person articulated this sentiment:

I know this may sound corny, but it's like the heart of our community because it's the only thing that we know that everybody comes to. And it's like something that brings our community together. Because without the garden, I think we would be just a little bit more separate. Because this is something we can call our own, the whole community, the whole block, and we didn't [previously] have anything where we could all come to at once. We know we can depend on it, so it's like the heart of our community.

These regular interactions in the garden yielded close relationships between youth and adult residents in the neighborhood, friendships among the youth, and opportunities to develop interpersonal skills in negotiation, conflict resolution, and communication.

Although numerous adult gardeners were tangentially involved with the youth garden programs in East Bishop/East Flint Park and Lakewood Village, both programs had several adult facilitators who were particularly dedicated to working with the participating youth. These adults, with the support and assistance of other neighbors, supervised the young people who participated in the gardens, shared their gardening knowledge and skills, and were mentors and role models. The close relationships that these youth developed as a result of their regular interactions with neighborhood adults in the community garden were a prominent theme in the interviews. Both youth and adults attested to the family-like bonds that evolved as a result of the garden programs. Several gardeners were given affectionate nicknames, such as aunt, auntie, uncle, the goody man, and the candy man. More than half of the young people interviewed described at least one adult who participated in the gardens with whom they now had a close, caring relationship. One youth explained:

They [the adults involved in the community garden] encourage us. Like when they helped us start out, then they let us go like the eagle did the eaglet. They kept us and then they let us go because they know that we could do better by ourselves now, since they

helped us so much. That's why we don't hardly have any more supervisors but [the youth program leader]. She was by us every step of the way.

Many of the gardeners expressed the depth of their affection for the children they worked with in the community gardens. One adult gardener described how he got involved in working with children and adolescents in the community garden youth program:

I do [like hanging out with the youth] now, but I didn't. I didn't think I was a kid person, but you know, God will make a difference in your heart. They asked me to work with the kids at church, and I didn't want to do that. . . . But over here, I don't mind working with the kids. And I can't understand why, except that, I guess maybe this is my neighborhood. . . . I think in my heart, I feel like these are my kids. So I try, I look at them as being my own kids.

In addition to teaching the youth about gardening and other related skills, many of the gardeners made an effort to get to know the youth, their interests, and their struggles. One gardener talked about the sustainability of her own and other adults' relationships with the youth: "So there was a bond there, a connection that will always be [even once] the children are out of the garden, out of the block club. They know that we loved them by sharing and caring and doing."

The community gardens also provided a context that promoted the development of positive peer interactions and friendships. Several of the youth from Lakewood Village and all of the youth from East Bishop/East Flint Park interviewed for this study indicated that they had either made new friends or become better friends with other neighborhood youth as a result of their involvement in the Flint community gardens.

Although several interview participants mentioned instances of tension and conflict between young people in the neighborhood, they always followed up with stories of how working together in the garden improved formerly discordant relationships. For example, one youth explained:

I used to get mad over little stuff like why you didn't give me the bag? Or why you didn't let me plant the flowers, so she could think I planted the most or something. But now we just get along, like we shouldn't be arguing over little stuff like that. We're all helping out,

you know, nobody's gonna do the most, nobody's gonna do the least. We're all doing the same thing, so why should I get mad?

Garden leaders sometimes played a facilitating role in the development of peer relationships. They were described as promoting communication, cooperation, and interpersonal skills through teamwork and other activities. One adolescent explained how she became close friends with a neighbor girl she had not previously liked after working together in the community garden:

Interviewer: So, [you said] what you like about the community garden is that you get to be friends with people that you. . .

Youth: Didn't get along with. . . Oh, when I first moved on this street, we didn't like each other for a while. She kept riding up and down with her bike and rolling her eyes. . . She kept rolling her eyes. And then we just ignored her, and then she kept saying, "You're scared, because you aren't doing nothing." She thought we were scared because we wouldn't do anything. So we just kept ignoring her, and then when we got all into the block club, she kept mean mugging us, like staring at us, and rolling her eyes even more. We started working together. Now we call each other sisters and stuff.

Interviewer: So what happened? Was it working in the garden that made you friends?

Youth: Yeah, because sometimes she [the youth program leader] put us in groups . . . and especially if you don't get along with the person. . . . Teamwork.

### *Informal Social Control*

Several of the adult gardeners, particularly those who interacted with the children and adolescents on a more regular basis, also described the expectations of appropriate conduct they had in the garden programs and often in other contexts as well. Some of the rules addressed safety and garden particulars; others, however, were applicable in a variety of situations, such as respect for elders, appropriate behavior, and use of acceptable appearance and language. One elderly gardener described how the kids he interacted with in the community garden, "know how to say, 'yes sir,' 'no sir,' 'no ma'am,' and 'yes ma'am.' They're good kids when they do that nowadays. . . ." Another adult explained:

This is the kind of foundation that you have to lay with children, in order that when they grow up and start in to their sinful ways, that you have laid a solid foundation there so they are going to respect you. And I don't know any children in this neighborhood that I can't walk through this neighborhood and they won't change what they're doing. Because I speak to them. I'll even stop and talk to them.

The relationships formed between neighbors participating in the community gardens and related neighborhood activities also facilitated collective action to prevent local youth from engaging in delinquent behavior.

Now when you see something that's not going on right, like if kids were breaking out windows at a house that had just become vacant, everybody in the neighborhood came out and was talking about. They got after the kids about breaking out the windows. Whereas before they would have said, "Well, I'm not gonna say anything to them." But I think by everybody getting together with the garden, . . . parties at the police precinct and things, they know their parents. And if they know their parents, they know they can say something to that child about don't break windows. . . .

### *Cognitive and Behavioral Competencies*

The youth who worked in the community gardens and their adult mentors emphasized that the gardens promoted responsibility, hard work, and delayed gratification. One young person articulated, "We learned [from the garden] that responsibility is important. When we do responsible things, it helps us do other responsible things in life, like when we grow older." According to one adult neighbor, the community garden was:

Teaching the kids a little responsibility. [There was] a work program, where I think the block club bought rakes and shovels and stuff. . . . It taught them responsibility. It's got the kids thinking about responsibility because once the garden is planted and begins to bloom, [they're] out in the neighborhood, helping the elderly, helping older people, cleaning up yards, or painting up houses. . . . So, it gives them something to do. And, like I said, it gives them that sense of responsibility.

The gardens were described as teaching the involved youth about the value of hard work. One youth explained:

Hooo, it [the lot that the community garden is now on] was a big mess! Took a while to clean up too, but I'm glad that we got it done. [It took] weeks. We just got all that up. . . . It had lots of bugs and everything, but we cleaned it up and we put flowers in. It looks much better now. . . . [Before all this], I was thinking, uh-ah, I don't wanna do this. This is too much mess. I don't got time. I could just be playing and having fun. I don't wanna waste my time just cleaning this up. We talked for a couple weeks and I'm like, oh this sounds interesting and then we did it. It's fun. It's hard work, but it's fun too.

Many garden tasks require ongoing commitment and patience, since vegetable and fruit plants must be weeded and watered regularly for weeks or months before bearing fruit. The youth described their dedication to caring for the ongoing needs of the plants. For example, when asked, "How does a plant grow?" one youth explained:

Like you dig it up out of the dirt, and you put the seeds in there. Instead of just leaving it there and covering the dirt, you just don't leave it. And you can't forget about it. You gotta keep watering it because the seed will need water and sunshine to grow. And you gotta keep on checking on it to see if it's gonna grow or not.

### *Nutrition and Eating Fresh Fruit and Vegetables*

The community gardens also provided the youth with opportunities to learn about nutrition and to eat more fresh fruit and vegetables. As one adult gardener said, the youth, "take pride in their work and being able to learn what nutrients that food produces, the vitamins, minerals, or what portion of your body that by eating this what it would help." Youth mentioned that their involvement in the gardens induced them to eat more fruit and vegetables and less junk food. One youth explained, "I love really rich cabbage because it seems like it has oil dripping off of it, but it's good. I know it sounds gross, but it's really good, just to know there's no oil or no fat or anything. It makes me feel healthier." Another commented, "I used to be a candy freak, but now after all the vegetables that you get, they are good. They are like candy, but they're healthy."

Due to the easy access to fresh produce they had helped to cultivate, the young people who worked in the community gardens frequently tasted the vegetables they had grown. Several neighbors prepared food with the youth, utilizing fresh fruit and vegetables from the gardens. The youth

tasted vegetables they had never eaten before and learned to like ones they had not previously enjoyed. When asked what she liked about the garden, one adolescent replied, "Eating new stuff." Another youth offered this story:

Okay last year, I think it was last year, [one of the adult gardeners] said we can grab some tomatoes. So we grabbed some red tomatoes and we got some sauce to go with the tomatoes. So we cut the tomatoes up with the salad. So I dipped the tomato in the sauce, in the dressing, I was like, "Oh, it's good." And [my friend] was like, "Let's go try a green tomato," and that's how I started liking the garden food.

## DISCUSSION

This study was designed to understand the role of Flint community garden youth programs in promoting positive youth development and healthy eating, as articulated by adult gardeners and neighbors, youth, and community police officers. The results of this study illustrate that neighborhood-based community gardens can positively influence the development of disadvantaged youth by providing opportunities to cultivate assets of a constructive activity, positive contributions to the community, relationships with other adults and youth, interpersonal skills, informal social control, cognitive and behavioral competencies, and improved knowledge of nutrition and consumption of fresh fruit and vegetables. Many of the developmental assets identified in this study are consistent with those discussed in the literature.<sup>11,13-16</sup>

Providing youth with constructive activities outside of school, including afterschool programs and summer programs (the Flint community garden youth programs could be characterized as both during different stages of the growing season), has been recognized by the US Departments of Education, Health and Human Services, and Justice as playing a key role in keeping children safe, out of trouble, and engaged in school. These types of programs have been shown to reduce children's involvement in alcohol, drug, and tobacco use and sexual activity.<sup>33-35</sup> They are suggested to reduce the likelihood that youth are victimized or perpetrators of crime, which may improve the quality of life in their neighborhoods.<sup>34</sup> Youth programs have also been shown to improve learning and school engagement, regardless of whether the programs focus on academics or not.<sup>33-35</sup> Unfortunately, due to the economic strain experienced by Flint residents and the city government, many

working families likely cannot afford the costs associated with enrolling their children in recreational afterschool and summer programs and limited free opportunities are available. The Flint community garden youth programs fulfilled the need for more youth programs in the area by providing adult supervision during a structured, constructive activity in which youth could feel proud of their achievements and contributions.

Planting rows of vegetables in the community gardens for donation to homeless shelters may have been particularly important to the youth because hunger is not uncommon in Flint. In 2005, more than 15% of Flint residents reported that they did not always have enough to eat.<sup>36</sup> Interview participants described families living in their own neighborhoods that were experiencing food insecurity. Volunteering early in life to improve one's community and aid those less fortunate is associated with higher rates of volunteerism among adults.<sup>37</sup> Researchers suggest that this also contributes to life satisfaction, self-esteem, socioeconomic achievement, civic engagement, and reduced likelihood of engaging in detrimental behaviors.<sup>37</sup>

In a survey conducted in Flint at the same time as this study, adults who participated in community gardens and beautification activities reported spending significantly more time with local teenagers and children than non-participating residents<sup>19</sup> (also K. Alaimo, T. Reischl, and J. O. Allen, unpublished data). These findings are consistent with other research on the impact of outdoor vegetated spaces on the frequency of child-adult interactions.<sup>29,30</sup> More frequent intergenerational interactions are likely to facilitate the supervision of children and youth, role modeling, and the development of relationships. Having close bonds with caring unrelated adults, as was experienced in these neighborhood gardens, can positively impact youths' development in numerous ways. These adults can become mentors, fulfill some parental functions when a child's own family resources are strained, and provide information, support, and advice. Social capital, including having a strong help network and involvement in community groups, has been shown to help youth growing up in disadvantaged communities negotiate the challenges associated with poverty, marshal the limited resources and opportunities in their community, and achieve socioeconomic success in adulthood.<sup>37-40</sup>

The development and maturation of close relationships with adults and peers also facilitate youths' development and support their emotional, physical, and social health. Larger and more varied social networks, such as those developed by the youth as a result of their participation in community gardens, have been associated with access to social support and



mental and physical health benefits.<sup>41</sup> Although younger children often build their friendships on shared activities, older children and adolescents begin to cultivate interpersonal bonds characterized by more meaningful support, trust, acceptance, self-disclosure, and companionship.<sup>42</sup> Establishing these relationships within a positive context, characterized by shared interests and values as was the case with the Flint gardens, is particularly beneficial. This is because the behavior and choices of young people are often strongly influenced by the people they develop friendships with, whether adults or peers.<sup>43</sup>

Community gardens, such as those described in this article, are also “green spaces.” This is an area of research that may illuminate some of the mechanisms through which gardens promote youth development. Several studies indicate that contact with natural “greenness” in the form of vegetated play areas, views, or even the presence of plants in the home can improve the cognitive functioning of children and adolescents, particularly attention span and impulsivity.<sup>44,45</sup> These cognitive benefits are likely to facilitate the development of youth in several of the areas that emerged in our findings, such as success at developing close relationships with adults and peers and other behavioral and cognitive competencies. The sense of responsibility, work ethic, and delayed gratification that the youth developed while working in the community gardens are all valuable skills that may better prepare these youth for academic challenges and the demands of the workforce.

Although overall health is infrequently identified as an important developmental asset in the literature,<sup>11,13–16</sup> poor health status has been linked with a variety of negative outcomes such as all-cause mortality, poverty, and depression.<sup>46–50</sup> The case study community garden youth programs promoted health through improved nutrition and consumption of fresh fruit and vegetables. The youths’ involvement with the community gardens may improve their nutrition currently and in the future. During the garden season, the youth in this study had improved access to inexpensive fresh produce, which is important in a city where few supermarkets are located within the city limits and small neighborhood stores tend to stock limited selections of costly fresh fruit and vegetables.<sup>51–53</sup> Adults with a household member who participated in community gardening have been shown to eat fruit and vegetables more frequently than members of non-participating households.<sup>18</sup> Youth are also more likely to taste vegetables they have grown themselves.<sup>54</sup> The children and adolescents who worked in the community gardens improved their nutrition knowledge and skills and developed more varied palates. Food preference

and eating habits established during childhood are believed to predict lifetime dietary behavior.<sup>55-57</sup> The youth involved in the Flint community gardens may continue to eat more and a greater variety of fruit and vegetables than their peers, which is associated with a reduced risk for developing a variety of cancers and cardiovascular disease.<sup>58-60</sup>

### *Limitations*

Although the voices of people involved in the Flint community gardens provide a unique perspective on the contributions of youth gardening programs to the development of neighborhood children and adolescents, several limitations should be noted. These two case studies are not representative of all urban community gardens nationwide, many of which include young gardeners but lack formal youth programs or the volunteers to run them. In many other cities, gardeners participate in allotment gardens where individuals purchase the exclusive use of a small parcel within a larger lot. In contrast, in these gardens neighbors cultivated and harvested lots collectively. Community gardens, particularly neighbor-initiated and -supported ones, are diverse and shaped by existing assets, relationships, resident characteristics, and capacity in the host community. Nonetheless, many of the inherent characteristics of community-based gardens when coupled with a focus on developmental assets are likely to promote the growth of involved young people.

The broader focus of the larger study from which this analysis is derived also provided some limitations. The interview guide was made up of broad questions about community gardens, rather than questions that examined the specific topics of interest explored in this analysis. The analysis was also constrained to the interviews that were conducted. Information was not collected about youth who were not interviewed, including those who participated in the garden youth programs prior to when the interviews were conducted but had dropped out. This may, in part, account for the small number of negative examples of how participation in community gardens affected youths' development.

Qualitative research methods and data analysis techniques often elicit concerns about data validity and reliability. The accuracy of self-reported information is also an important consideration when relying primarily on interview data. In order to diminish this problem, all interviews were confidential, the second author was a participant observer who developed rapport with members of the studied communities, and community members were relied upon to review all of the quotes used in our coding

scheme (member checking) for accuracy and in order to identify false information.<sup>61–63</sup> Our data analysis strategy involved a systematic process of coding scheme development, refinement, and quote attribution. Triangulation was utilized in assessing the consistency and reliability of the organizing scheme, including repeated reviews by the first two authors, thorough examination by two community gardeners, and a final review by the research committee

Despite the challenges of qualitative research, the information elicited through in-depth interviews effectively captures multiple local contexts by tapping into many different voices and perspectives in informants' own words.<sup>64,65</sup> The CBPR approach of this project also encouraged reflection among interview participants and members of the research committee on how the gardens affected their lives and how they and the larger community benefited from having neighborhood gardens in the city.

### **Summary**

In summary, community gardens can promote the development of local youth while concurrently improving the neighborhoods in which they live. Through community gardening projects, residents appropriate abandoned and misused land to create places of beauty, reduce fear of crime, and discourage illegal dumping and other undesirable activities.<sup>17,25</sup> Although living in a distressed neighborhood can compromise the health and development of youth,<sup>3,7</sup> this effect is not without exception. In this study, analyses yielded strong evidence that two neighborhood youth garden programs significantly and positively influenced the participating youths' healthy development and nutrition and suggest that comparable youth garden programs are likely to have similar effects.

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