



Research on the Benefits of Youth Garden Programs

Over the past three decades, obesity rates have skyrocketed in the United States and now more than a third of all adults are obese. Unfortunately, the statistics for children are following the same trend. The obesity rate among children has more than tripled since 1980 and now stands at 17 percent in 2014. There are many factors contributing to this rise in obesity among adults and children, including behavior (diet and physical activity) and community and school environments (Center for Disease Control 2015).

Research shows that one solution to this problem could be instituting school gardening programs. Studies of school garden programs have shown many benefits, including (1) increased openness to, preference for, and intake of fruits and vegetables, (2) increased academic performance and attitudes toward learning, (3) improved health and behavior at home and at school, and (4) improved environmental appreciation and attitudes.

1. Increased openness to, preference for, and intake of fruits and vegetables

Robinson-O'Brien et al (2009) found that “exposure to garden-based nutrition education [is] associated with **increased fruit and vegetable intake.**”

After a combined nutrition and gardening program among 6th graders, **participants ate an average of 2.5 more servings of fruits and vegetables**—more than double what they ate prior to the program (McAleese and Rankin 2007).

Pre and post surveys of the Delicious and Nutritious Gardening program participants showed a **significant increase in their preference for vegetables** (Heim et al. 2009).

Fourth graders who went through a gardening-nutrition program showed **greater preferences for fresh vegetables and fruits** than before the program, and were more **willing to try new fruits and vegetables** than fourth graders who only had the nutrition component (Morris 2002).

Students who received garden *and* nutrition education were **more likely to choose vegetables in their school cafeteria meal and had a higher preference for vegetables** than both students in the control group and students who only had nutrition education (Parmer et al. 2009).

Youth Farm Market Project participants were **more open to trying food from other cultures and more willing to try and eat vegetables** (Lautenschlager & Smith 2007).

Berezowitz et al. (2015) reviewed 12 separate studies that showed **school garden interventions lead to increases/improvements in fruit and vegetable consumption.**

The introduction of a school food garden for elementary and middle school students grades 4-7 led to **“new skill and attitudinal changes conducive to enhancing vegetable and fruit consumption”** (Somerset & Markwell 2008).

Students exposed to multiple components of a garden-based intervention scored **higher on fruit and vegetable intake, self-efficacy, and knowledge and lower on preference for unhealthy foods** (Evans et al. 2012).

A cooking, nutrition, and gardening after-school program in a garden-based **setting improved attitudes and preferences for fruits and vegetables in Latino youth** (Gatto et al. 2012).

2. Increased academic performance and attitudes toward learning

Science achievement of students who participated in a hands-on (i.e., experiential) gardening program was **higher than that of students who only engaged in classroom curriculum** (Klemmer et al. 2005).

Garden-based learning associated with **increased scores in science achievement tests** in a controlled study (Smith & Motsenbocke 2005).

Participants in a school garden program in California experienced significant gains in overall GPA in math and science, and improvement on a standardized psychosocial questionnaire. Teachers stated that gardening programs led to more conducive learning environments (Murphy 2003).

Environment-based education, of which school gardens were a part, **increased attention and enthusiasm for learning** (Lieberman & Hoody 1998).

A review by Berezowitz et al. (2015) showed school garden interventions lead to **improvements in science achievement and math scores**.

Williams & Dixon (2013) reviewed findings in articles published in 1990-2010 and found 48 studies that showed school gardens had a **positive impact on academic outcomes, with the highest impact for science, followed by math and language arts**.

Integration of middle school literacy curriculum into the school garden supports increased learner engagement. **Students with learning difficulties and behavioral issues benefitted the most from the garden as a literacy learning environment** (Pascoe & Wyatt-Smith 2013).

A robust garden intervention that included garden-related lessons and gardening activities had a **positive effect on children's knowledge of plant science and nutritional science** (Wells et al. 2015).

3. Improved health and behavior at home and at school

Alexander and Hendren (1998) found that a school garden program improved **self-esteem, a sense of ownership and responsibility, and family relationships** among participants.

Having gardens at school can help to create an environment that supports healthy eating habits and students who are more connected to the garden tend to be more **positively bonded to their school**. In turn, students who are more connected to school “show lower levels of emotional distress, risk behavior, and aggression” (Ozer 2007).

Children who spent time in school gardens **move more and sit less during an outdoor garden-based lesson**, thus school gardens show promise to promote children's physical activity (Wells et al. 2014).

Permaculture food gardens **can contribute to children's physical, mental, and emotional health** (Beery et al. 2013).

Child-initiated, non-structured play in the garden often leads to **more pro-social behavior and social interactions such as sharing, helping others, and collaborative play** (Laaksoharju et al. 2012).

4. Improved environmental appreciation and attitudes

Lautenschlager & Smith (2007) found that participants of the Youth Farm Market Project had a **greater appreciation for the environment** than non-participants.

Skelly & Bradley (2007) showed that after completing a garden program, the **environmental attitudes of participants improved** and were higher than non-participants.

Collado & Carraliza (2015) found that restorative experiences in a schoolyard **enhanced children's pro-environmental behavior**.

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