

Can School Gardens Help to Reduce and Prevent Obesity?

All around the country schools have answered the call to resolve the issue of inadequate fruit and vegetables intake in children in hopes to resolve the bigger issue of childhood obesity by implementing school garden programs. Programs such as the Farm to School program which connects schools (K-12) and local farms with the objectives of serving healthy meals in school cafeterias, improving student nutrition, providing agriculture, health and nutrition education opportunities, and supporting local and regional farmers are active in 44 states all around the country. (1) While each program is unique to its own demographic, the goal remains common. That is to increase awareness, appreciation, and consumption of fresh fruits and vegetables.

The CDC reports that approximately 17% (or 12.5 million) of children and adolescents ages 2—19 years are obese. (2) While causes of obesity in children are hypothesized to be related to a variety of factors, it has been suggested that one contributing factor is the trend of calorie dense foods displacing nutrient dense foods such as fruits and vegetables in the American diet. According to a survey conducted by the CDC, only 32.5% of Americans consume the recommended two servings per day of fruits and only 26.3% consumed the recommended three servings per day of vegetables in 2009. (3) Many studies have examined the possible reasons for such as nutritional shortcoming in the American diet and many researchers have identified accessibility, income, acculturation, convenience foods and awareness as reasons that someone would not consume adequate fruits and vegetables. Children specifically are at risk for not consuming enough fruits and vegetables if they are in a household where the parents are not leading by example.

Programs like the *Nutritious and Delicious Garden* have proven to be successful. In this garden pilot project, children ranging from 4th to 6th grade participated in a 12 week program as a part of a YMCA summer camp. The intervention was designed to promote fruit and vegetable intake among participants through garden based activities twice a week, educational activities including fruit and vegetable taste tests, preparation of fruit and vegetable snacks and family newsletters sent home to parents. The study utilized a pre

and post survey to determine the effectiveness of the program. At the end of the 12 weeks, though there was no increase in fruit preference, children were reported to have an increased preference for vegetables. This preference was most notable for vegetables they had not previously been exposed to, such as beets, zucchini, or radishes. The study found an increase in asking behavior, meaning that children requested more vegetables than they had prior to the study. (4)

Another study evaluated the Youth Farm and Market Project (YFMP), a 10 week garden program which educated inner-city youth about environmental responsibility, cultural diversity, and the food system. YFMP was established in 1994 in South Minneapolis and currently operates in three neighborhoods. The program teaches children about these concepts via gardening and cooking activities as well as a passive nutrition education curriculum three times per week. The effectiveness of the program was measured by surveys at the beginning and end of the program. Findings of the study included a modest increase in knowledge of gardening and nutrition as well as a significantly increased intake of fruits and vegetables. The conclusion of the study suggests that increased exposure to and knowledge of fruits and vegetables improves the likelihood of children to consume them. This is especially important for inner-city children who otherwise may not be exposed to such food items. (5)

While programs like the Nutritious and Delicious Garden and Youth Farm and Market Project seem to have a positive effect on children consuming more fruits and vegetables, there is still very limited data on whether these programs are helping to decrease the obesity rates for children who participate in school gardens.

The Osceola County school district in Central Florida was able to make significant improvements in weight and BMI of elementary school students through a program called HOPS, *Healthier Options for Public Schoolchildren*. This pilot study was implemented over two school years from 2004 to 2006 and included 2,494 children. HOPS incorporated different kinds of interventions to support better nutrition amongst the participants. The participating schools underwent a rigorous modification to the school breakfasts, lunches, and extended day snacks. Menus were modified to include more fresh fruits and vegetables

and whole grains while decreasing the amount of processed bakery goods and other higher glycemic index foods. The curriculum component of the pilot consisted of school based wellness projects to teach parents, teachers, and staff about good nutrition and the benefits of daily physical activity. Fruit and vegetable gardens at the participating elementary schools provided a fun and creative component of the intervention. The goal of implementing the school gardens was to teach children how the nutritious fruits and vegetables they eat are grown, cultivated, and harvested. The outcome of this pilot study revealed that children who participated in HOPS decreased their mean BMI, overall weight, and systolic blood pressure compared to students in the control group. Girls had a more significant decrease in all these values. Girls decreased their mean BMI and weight significantly from fall 2004 to spring 2006 while the change for boys was much smaller. Systolic blood pressure decreased for girls from an average 100.07 mm Hg at the beginning of the study to 98.3 mm Hg by the end. There was no significant change found in boys during the study. (6)

The HOPS study illustrates that school gardens alone cannot change childhood obesity. However, implementation of school gardens integrated into a program that addresses the food served school cafeterias, family eating practices, physical activity, and food awareness can have a profound impact on childhood obesity.

The movement of school gardens is still a relatively new one. Thus, the effectiveness of these programs will continue to be evaluated and researched. Here in the United States, food choices are influenced by a multitude of factors. Availability of food and awareness of certain foods will continue to be amongst the most crucial factors that affect food choices, especially in children. With the proven positive effects that school gardens are having on children's outlook on food, it is important to continue to promote such programs until fresh fruits and vegetables become the norm and not the exception.

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