SCHOOL NUTRITION ASSOCIATION
The Journal of Child Nutrition & Management
Volume 41, Issue 1, Spring 2017
Published by School Nutrition Association

Survey of Principals Regarding Perceived Benefits and Barriers of School Gardens

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ABSTRACT

Purpose/Objectives
Schools are being challenged to provide physical activity and nutrition education to students, and one way to do so is through the utilization of school gardens. The purpose of this study was to determine perceived benefits and barriers of implementing school gardens.

Methods
A total of 896 principals employed by Mississippi public schools were invited to complete an electronic survey. Three versions of the survey were available for those with school gardens, those without but wanting a garden, and those with no garden and no desire to have a garden.

Results
A total of 178 usable responses were received. The majority of survey respondents were school principals (n=144) from elementary schools (n=87) in rural communities (n=112). Responses indicated that 51 schools had a school garden, while 127 schools did not have one. At schools with gardens, the most frequent perceived benefits for children included increased environmental attitudes (56.9%) and improved attitudes toward school (45.1%). Perceived barriers that may prevent schools from developing school gardens included time constraints (62.7%), lack of funding (60.8%), and lack of gardening supplies (43.1%).

Applications to Child Nutrition Professionals
Before implementing a school garden, it is important to understand the benefits and barriers that are involved. Child nutrition professionals interested in school gardens can use this information to plan for effective resource utilization and marketing.

Keywords: school garden; school nutrition programs; nutrition education

INTRODUCTION

Beginning with the Child Nutrition and WIC Reauthorization Act of 2004, all schools participating in the National School Lunch Program (NSLP) were required to create wellness policies that included school nutrition and physical activity. In 2012, both the NSLP and School Breakfast Program were required to comply with revised nutrition standards (Healthy, Hunger-Free Kids Act, 2010; U.S. Department of Agriculture [USDA] Food and Nutrition Service [FNS], 2012). The new standards required schools to increase the availability of fruits, vegetables, and whole grains as well as reduce sodium and eliminate trans fats.

In general, schools are challenged to serve healthy meals, provide physical activity and nutrition education to students, and maintain financial as well as educational accountability. To meet these

rigorous requirements, schools must find efficient, comprehensive ways to integrate health (nutrition and physical activity) into the normal school day. One possible way to integrate health activities and learning is through the utilization of a school gardening initiative. Children at schools with gardening programs have reduced sedentary behaviors and increased moderate and moderate-to-vigorous physical activity during school days (Wells, Myers, & Henderson, 2014).

Many examples of successful school gardens under the leadership or direction of child nutrition programs exist (i.e. Detroit Public Schools Community District, 2017; New York City Public Schools, 2017; Framingham Massachusetts Public Schools, 2017). The USDA has developed resources to assist school nutrition professionals in establishing a school garden program (i.e. USDA-FNS, 2016). These resources address legal issues, policies and procedures, food safety, recipes, and nutrition education. In support of schools gardening and to clarify procedures, the USDA has published policies and guidance reiterating that schools participating in NSLP are allowed to use funds from the nonprofit school food service account to purchase items for the school garden such as seeds or fertilizer as long as the items are used for maintaining the garden (USDA-FNS, 2009; USDA-FNS 2014).

A "garden-to-cafeteria" program may be an effective way to encourage participation in the NSLP and forge relationships with classroom teachers using the school garden as a classroom. Integrating nutrition education, school meals, and classroom requirements may help reinforce the importance of healthy minds and healthy bodies. The USDA-FNS (2014) "…encourages innovative ways of meeting the goals of the school meals programs….school gardening and other farm to school educational activities can improve school food service operations in a variety of ways." Uncovering obstacles preventing schools from building and maintaining school gardens is essential for overcoming barriers. Therefore, the purpose of this study was to determine perceived benefits and barriers of implementing school gardens.

METHODS

Instrument

The Mississippi School Garden Needs Assessment survey was created by compiling questions from the *California School Garden Survey* (Life Lab & California School Garden Network, 2014) as well as questions that were developed by the researcher after speaking with key informants and Cooperative Extension professionals throughout the state. Prior to distribution, the survey was evaluated for face and content validity by nutrition graduate students, Cooperative Extension professionals, and school nutrition experts. After edits were made, the survey was pilot tested with three Mississippi public school teachers and the survey was again modified according to the recommendations received.

Participants were asked if they had a school garden and those who reported that they had a school garden received a different set of questions (Version I) than those who reported that they did not have a school garden. If the participants did not have a school garden, but were interested in building one, a different set of questions was provided (Version II) than for those who were not interested in building a school garden (Version III).

Version I

Participants who reported having a school garden received a total of 36 closed-ended questions. The number of answer choices available for each question varied depending on the question, and some questions had the option for open text as an "Other" response. Variables measured included school demographics, garden descriptions, and perceived benefits and barriers.

Questions about perceived benefits focused on environmental attitude, attitude toward school, fruit and vegetable intake, eating new kinds of food, and increased self-confidence as well as other topics. Barriers included lack of staffing, little to no knowledge about gardening, lack of gardening supplies, lack of funding, difficulty linking to core academic standards, lack of volunteers, no interest in having a garden, inadequate space, risk of vandalism, time constraints, few or no instructional materials, and lack of technical assistance with garden.

Version II
Participants who did not have a school garden, but were interested in one were given 35 closed-ended questions with varying numbers of answer choices and some "Other" options. The only difference between Version I and II was that each question asked the participants what they would want *if* they had a school garden or what benefits they perceive the students *might* receive through participation in school gardens.

Version III
Participants who did not have a school garden and were not interested in one were given seven closed-ended questions and an open-ended question asking them to state why they were not interested in building a school garden for students.

Participants and Procedures
Methods for the study were approved by The University of Southern Mississippi Institutional Review Board. A total of 896 principals employed by Mississippi public schools were invited via email to complete an electronic survey designed to gain insight into the administrators' perspectives of school gardens. Researchers used a standard email survey methodology where contacts were emailed repeatedly at set intervals to remind them to respond. Principals were asked to forward the survey to others in the school who may have been more familiar with the school garden initiative. Informed consent and a direct link to the survey were provided in the individualized and confidential email. Descriptive statistics were used to summarize perceived benefits and barriers of school gardens as well as describe perspectives on the relationships between school gardens and fruit and vegetable consumption and food insecurity.

RESULTS AND DISCUSSION

A total of 178 usable responses were received. The majority of survey respondents were school principals (n=144) from elementary schools (n=87) in rural communities (n=112). Of the schools that were included in the survey (n=177), the majority (n=127) did not have a school garden (Table 1). Proportionally, more urban schools had a school garden (n=15/36) compared to rural schools (n=30/112) and suburban schools (n=6/29). More than half (n=29) of the 51 schools with gardens reported that the garden had been built within the last three years.

Most schools used the plants grown in the school garden for academic study (n=35). Of the schools that had school gardens (n=51), the third (n=20) and fourth (n=20) grade levels had the most frequently reported participation in garden activities (Table 2). School teachers (n=39) taught in the garden more frequently than any other outside instructor or volunteer. The most frequently taught subject related to gardening was science (n=38), and most schools did not incorporate the school garden into education about Farm to School or Farm to School promotions (n=33).

Table 1. ***Characteristics of Schools and Respondents**** (N=178)

Characteristic	n	%
Role in district		
Principal	144	81.4
Teacher	24	13.6
School Nutrition Director	4	2.3
Other (parent or community volunteer)	5	2.8
School area		
Rural	112	63.3
Urban/suburban	65	36.7
School garden		
No	127	71.3
Yes	51	28.7

*As a result of missing data, some questions have different frequencies than others.

Table 2. ***Description of Uses for School Gardens in Schools with Gardens****(N=51)

Variable	Yes	
	n	%
Used for academics		
Yes	40	78.4
No	8	15.7
Produce usage		
Academic study	35	68.6
Harvested for consumption and sent home with students	16	31.4
Harvested for consumption and eaten during garden time	16	31.4
Donated	9	17.6
Sold	7	13.7
Composted	7	13.7
School lunch	3	5.9

*As a result of missing data, some questions have different frequencies than others, respondents could choose more than one option.

Perceived benefits selected by administrators in schools *with* gardens (n=51) included increased environmental attitude (n=29), improved attitude toward school (n=23), increased fruit and vegetable intake (n=22), eating new kinds of food (n=20), and increased self-confidence (n=18) (Table 3). For schools with gardens, most did not have summer maintenance, but if available, it was the responsibility of teachers (n=14). About 45.1% (n=23) of schools reported less than $100 for an annual school garden budget, and schools with more substantial budgets received funding from grants (n=16), the district (n=14) community/business donations (n=14), or individual donations (n=13). Top barriers for building and maintaining a school garden included time constraints (n=32), lack of funding (n=31), lack of gardening supplies (n=22), and lack of staffing (n=20).

Table 3. ***Benefits and Barriers of School Gardens Indicated by School Principals and Other Personnel at Schools with Gardens*** (N=51)

	n	%
Benefits		
Increased environmental attitude	29	56.9
Improved attitude toward school	23	45.1
Increased fruit and vegetable intake	22	43.1
Eating new kinds of food	20	39.2
Increased self-confidence	18	35.3
Increased social skills/behaviors	16	31.4
Improvements in health and nutrition	15	29.4
Decrease food insecurity	14	27.5
Sense of volunteerism	13	25.5
Increased community spirit	13	25.5
Decreased fast food intake	10	19.6
Increased leadership skills	9	17.6
Increased academic performance	9	17.6
Increased grades	8	15.7
Other	6	11.8
Improved motor skills	6	11.8
None	5	9.8
Barriers		
Time constraints	32	62.7
Lack of funding	31	60.8
Lack of gardening supplies	22	43.1
Lack of staffing	20	39.2
Lack of volunteers	17	33.3
Few or no instructional materials	14	27.5
Risk of vandalism	12	23.5
Little to no knowledge about gardening	10	19.6
Inadequate space	7	13.7
Difficulty linking to core academic standards	4	7.8

Schools that *did not* have gardens and were not interested (n=48), most often reported time as the reason (n=22). Other reasons for not being interested in school gardens included inadequate manpower related to garden labor (n=32), funding and resources (n=9), land (n=6), and lack of information about school gardens (n=5).

CONCLUSIONS AND APPLICATION

Through this study, researchers were able to gain insight into the perspectives of school administrators or designees such as principals, teachers, child nutrition directors, parent volunteers, or community volunteers regarding school gardens and determine the benefits and barriers of implementing school gardens. Considerations for school nutrition professionals before initiating a school garden include space, funding, and personnel.

Limitations of this descriptive study include the low response rate and lack of detail in responses. Because of the descriptive nature of this study, researchers are not able to make inferences from data. Strengths of this study include collaboration with experts in the area to help validate the instrument and the large sampling frame. Future research should examine benefits and barriers of implementing school gardens qualitatively so that more detailed information can be collected.

Most respondents at the 127 schools without school gardens were interested in developing one, especially using raised beds with the produce to be used for academic instruction and consumption. However, the main barriers that may be keeping them from having a school garden are lack of gardening supplies and lack of funding. Our findings were similar to those previously reported where reasons given for garden closure included lack of: 1) teacher time, 2) funding, 3) support, 4) experience, and 5) space (Azuma, Horan, & Gottlieb, 2001). School nutrition professionals can help overcome some of the challenges found in establishing a school garden. If gardening materials and activities can support the school nutrition operation or improve the school meal program, reasonable expenses from cafeteria funds can be used for garden development. Additionally, school garden grants are available from non-profit groups, and school nutrition professionals should be encouraged to work collaboratively to obtain these funds (Hazzard, Moreno, Beall, & Zidenberg-Cherr, 2012).

Though the greatest percentage of respondents directly cited proven garden related effects such as increased knowledge of the environment as benefits, other wellness aspects were positively influenced by school gardens. One such health benefit reported was an increased willingness to try new foods which could affect the school cafeteria and home life. In this study, an increase in fruit and vegetable intake along with exercise and a decrease in consumption of fast food were identified as benefits of school gardens. Benefits including an increase in children's vegetable consumption and willingness to try new vegetables have already been observed in many school garden intervention studies (Evans et al., 2012; Morris, Briggs, & Zidenberg-Cherr, 2002). Interestingly, more social interaction among students was another highly recognized benefit, perhaps because school garden activities are much less structured and incorporate more team-building exercises than typical classroom activities. This might also contribute to the belief that students have an improved attitude towards school when participating in school garden activities (Waliczek, Bradley, & Zajicek, 2001).

Mounting scientific evidence shows that garden-based nutrition education in schools can improve dietary behaviors and related psychosocial factors such as attitudes and beliefs about fruits and vegetables in young people (Hermann et al., 2006; Lautenschlager & Smith, 2007; McAleese & Rankin, 2007; Ozer, 2007; Robinson-O'Brien, Story, & Heim, 2009). Schools with gardens have the opportunity to enhance experiences with the NSLP by exposing students to fresh produce when it becomes available. The increased exposure to fresh produce has been linked to significant changes in fruit and vegetable consumption (Meinen, Friese, Wright, & Carrel, 2012; Morris et al., 2002). The hands-on experience of planting, nurturing, and then harvesting products brings a sense of achievement and accountability unique to eating produce out of a school garden, which may be one reason why children seem to prefer vegetables they cultivate (Cotugna, Manning, & DiDomenico, 2012; Morris et al., 2002). School garden efforts, led by school nutrition professionals could be a worthwhile source of positive learning experiences for students and publicity for a school district as well as for their respective school nutrition programs.

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