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Determining the Motivation of Childcare Providers to Implement Instructional Gardens as a Means of Increasing Fruit and Vegetable Consumption Among Children Ages 2 through 5

Kristin Leslie Davis

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Abstract

The issue of childhood obesity has been gaining an increasing amount of attention in recent decades due to sharp rises in prevalence. Efforts to encourage fruit and vegetable consumption among children through the use of gardening activities have become an increasingly popular strategy. Limited data currently exists, however, on using gardening programs with preschool age children in childcare settings. Using these types of programs may be effective in increasing exposure and access to fruits and vegetables for young children and therefore may be a useful strategy in preventing childhood obesity. This study sought to determine the motivations of childcare providers to implement instructional gardens. Qualitative interviews (n=20) were completed in order to gain information on perceived benefits and barriers to implementing gardening programs with young children including challenges experienced in current programs and resources that would be helpful in order to make future gardening programs more successful. Providers in family day care, group family day care, day care centers, and Head Start programs were interviewed. Benefits to using gardening in these settings with preschool age children included nutrition related benefits such as an increased willingness to try more fruits and vegetables and increased knowledge regarding food and where it comes from. Non-nutrition related benefits were also discussed including using gardens as a multi-disciplinary tool for teaching, encouraging a connection to the natural environment and fostering a sense of accomplishment and responsibility among the children. Main barriers to implementation or continuation of gardening programs were a lack of resources including financial resources for supplies, adequate knowledge and training, community and volunteer support, and adequate curriculum resources. Further research should

address ways in which to overcome the barriers experienced by motivated childcare providers to continue using gardening programs.

**DETERMINING THE MOTIVATION OF CHILDCARE
PROVIDERS TO IMPLEMENT INSTRUCTIONAL GARDENS
AS A MEANS OF INCREASING FRUIT AND VEGETABLE
CONSUMPTION AMONG CHILDREN AGES 2 TO 5**

Kristen L. Davis

Department of Public Health, Food Studies and Nutrition

David B. Falk College of Sport and Human Dynamics

Syracuse University

Master's Thesis

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Background and Significance

Prevalence of Obesity among Children

A major health concern affecting young children that has been getting a large amount of attention in recent years is childhood obesity. Childhood obesity is a concern for a number of reasons. First, individuals who are classified as overweight or obese during childhood are more likely to be overweight or obese as adults (Freedman et al., 2007). In addition, overweight and obese children are at a greater risk for certain health conditions including both physiological problems such as high blood pressure, dyslipidemia, impaired glucose tolerance, type 2 diabetes mellitus (T2DM), atherosclerosis, as well as mental health and developmental concerns (Nelms, Sucher, Lacey, & Roth, 2011, Nemet et al. 2005). According to recent research, children who are obese are less likely to report excellent or very good health and more likely to experience problems in school including increased absences, learning disability, and grade repetition. They were also more likely to experience depression than children of normal weight (Halfon, Larson, & Slusser, 2013).

A child is determined to be overweight if his or her body mass index (BMI) is greater than or equal to the 85th percentile on growth charts appropriate for that child's age and sex (Centers for Disease Control and Prevention, 2012). Obesity is similarly determined by a BMI of greater than or equal to the 95th percentile on a growth chart appropriate for a child's age and sex (CDC, 2012). According to data

from the 2007-2008 National Nutrition and Health Examination Survey (NHANES), 16.9% of children in the U.S. between the ages of 2 and 19 years old were obese.

Preschool age children are of particular concern when it comes to the childhood obesity epidemic. This group encompasses children between the ages of 2 and 5 years old. The prevalence of childhood obesity within this age group is a growing problem that has doubled in the last three decades (NHANES, 2010). While the increase in overweight and obesity among preschool children is a problem affecting children across the United States, certain populations are at an even greater risk. These include low-income populations and children from various ethnic backgrounds. According to data from the National Health and Nutrition Examination Survey 2005-2008, the prevalence of obesity among children decreases as the household income increases. One third of low-income children between the ages of 2 and 4 were considered to be overweight or obese (CDC, 2012). In New York State, more than 10% of low-income children between 2 and 4 years of age are considered obese (CDC, 2012) making this an issue of extreme significance.

Ethnicity also plays a major role in the childhood obesity epidemic as certain ethnic groups have significantly higher rates of overweight and obesity among children. Several studies have determined that American Indian and Alaska Native populations experience the highest prevalence of obesity among preschool-age children (Anderson & Whitaker, 2009; CDC, 2009). In 2008, 21.8% of low income, preschool-age children in this group were found to be obese. Among older children,

other studies have identified non-Hispanic black girls and Mexican-American boys as having the highest rates of obesity at 29.2% and 26.8% respectively (NHANES, 2010).

It is clear after examining the existing disparities that there are many factors involved in the development of health issues such as childhood obesity. Some include community and demographic factors such as socioeconomic status, as well as the accessibility of healthy food both at home and outside the home in school or childcare settings (Birch & Ventura, 2009). On a smaller scale, family eating behaviors such as parents' weight status and food intake patterns, as well as the family's nutritional knowledge have an impact on child eating patterns (Birch & Ventura, 2009). Finally, a child's own behaviors have the most direct influence on his or her weight status with behaviors such as physical activity, amount of time spent watching television, and food preferences (Birch & Ventura, 2009).

One strategy, according to the CDC (2012), to curb a child's risk for developing obesity is to consume the proper amount of fruits and vegetables. However, if a child has little access to fruits and vegetables or has a low preference for these foods, this strategy will not be effective. The ages between 2 and 5 years old are extremely important to the development of a child. During this time, children are not only growing rapidly, but they are also developing a large amount of their food preferences (Birch, 1998). This makes the preschool years a crucial time for the prevention of childhood obesity. At this age, children are learning a great deal about food and the behaviors that accompany it. They learn to identify

different foods, how to eat various foods, and various social and cultural aspects associated with food (Birch, 1998). This is a crucial point in time when healthful eating can be introduced and encouraged to increase the propensity for future healthy nutritional habits.

Nutrition in the Childcare Setting

According to the United States Census Bureau's 2010 Survey, over 10 million children under the age of 5 in the U.S. are cared for by someone outside of the family on a regular basis. These childcare providers include organized daycare facilities and centers, nursery schools or preschools, and family day care providers or group family day care providers (USCB, 2011). This means that on a regular basis, at least one meal a day is being consumed by children outside the home and served to them by someone other than their parents. Under these circumstances, the environment of the childcare provider becomes very important in influencing the food intake patterns of children.

The Child and Adult Care Food Program (CACFP) is a program that is funded by the United States Department of Agriculture and managed by individual state agencies to ensure that children who attend daycare centers or other childcare providers have access to healthy and nutritious food on a daily basis (United States Department of Agriculture Food and Nutrition Service, 2012). Within this program, childcare providers are funded or reimbursed for food items served to their attendees and they must abide by the CACFP guidelines set forth by the Institute of Medicine's dietary recommendations for each age group they serve. In addition, the

attendees of the childcare center must meet certain income requirements in order for the care provider to receive reimbursement so not all childcare providers are eligible for participation in this program (USDA FNS, 2012). Currently, the Institute of Medicine (IOM) recommends that the Child and Adult Care Food Program improve alignment with the dietary guidelines including offering more fruits and vegetables (IOM, 2010). For preschool age children between 3 and 5 years of age, the IOM recommends a meal intake pattern for lunch or supper to include one serving of milk, or 3/4 cup, two servings of fruits and vegetables, or 1/2 cup per serving, and 1 serving of meat or meat alternative, 1 1/2 oz. considered a serving (USDA FNS, 2012). However, data show that although these recommendations are in place, children are still not meeting their dietary requirements, particularly when it comes to fruits and vegetables. More than 25% of children between 2 and 5 years of age are not consuming any vegetables daily and among the vegetables that are consumed, fried white potatoes are the most common (Fox et al., 2010). While the consumption of fruit is higher among 2-5 year olds than that of vegetables, it is still not consumed daily by all children and occurs at roughly the same frequency as the consumption of sugar sweetened beverages, desserts, and salted snacks (Fox et al., 2010). These data, collected from the Feeding Infants and Toddlers Study (2008), show that children in this age group need to increase their vegetable intake and decrease their consumption of less nutrient dense foods and beverages in order to meet the dietary recommendations and decrease their risk for overweight and obesity.

In addition to the funding available to provide meals for children in childcare settings, various other aspects of the provider may influence the intake of food by the child. In a 2011 study, Lynch and Batal found that the meals served by childcare providers were influenced by a number of factors outside of the guidelines set forth by their source of funding. Some of the factors associated with mealtime choices by childcare providers were found to be the convenience of the meal, the attitudes of both the care provider and the parent, the nutritional knowledge of the care provider, and the availability and accessibility of healthy food (Lynch & Batal, 2011). In addition, some providers are not receiving funding from programs like CACFP and therefore do not need to adhere to any sort of nutritional guidelines when serving meals. Determining the factors that influence what and how meals are served in a childcare setting is crucial to finding strategies that are effective in improving the dietary intake of preschool age children.

Benefits of Gardening Programs with Children

The Impact of Gardening on Attitudes and Intake Patterns of Fruits and Vegetables

One strategy to deal with the childhood obesity epidemic and the failure to meet dietary recommendations of many nutrients is to increase consumption of fruits and vegetables (CDC, 2012). A method that has shown success in this area is the implementation of school gardening programs and interventions. A study conducted by Somerset and Markwell (2008) found that instructional gardens improve a child's ability to identify specific fruits and vegetables and this increased awareness of these foods can help to increase a child's willingness to try them and

therefore increase consumption of them. As previously discussed, children between the ages of 2 and 5 years old are forming many of their food preferences and intake patterns that they will carry throughout their life. The quantity and quality of the experiences they have with food at this time in their lives will have significant effects on the attitudes they develop toward food in the future. Having repeated positive experiences with certain foods has been shown to increase preferences for those foods (Birch, 1998). A study conducted by Nanney et al. (2007) found that children of families who grew produce at home consumed more fruits and vegetables as did their parents. This shows that the increased accessibility and availability of fruits and vegetables, which is made possible when children have access to gardens either at home or at school, is positively associated with intake of fruits and vegetables (Nanney et al., 2007). Other research shows that many children have very little knowledge of where food comes from and that participation in gardening activities can increase that knowledge (Kos & Jerman, 2012). While nutrition education can provide children with some of this knowledge they are lacking, combining education with gardening experiences has been shown to further improve knowledge and preferences for fruits and vegetables more than education alone (Parmer, Salisbury-Glennon, Shannon, & Struempfer, 2009).

Non-nutrition related benefits of gardening

With the increase in popularity among school and community gardening programs, a significant amount of research has been conducted across varying disciplines regarding the benefits of these gardening programs. While there are a

number of nutrition related benefits as previously discussed, much of the current research has focused on other areas including social development, academic success, and attitudes toward the environment.

Students participating in gardening programs have been found to have an increased sense of community and ability to work as a team as well as an increased sense of responsibility and care-taking (Blair, 2009). Educators using instructional gardens have found them to be a multi-disciplinary tool that can be used to teach a variety of subjects adding to their significance in the school curriculum. According to several studies, school gardens have been used to teach subjects ranging from science and math to art and music in addition to their use as nutrition education tools (Graham, Beall, Lussier, McLaughlin, & Zidenberg-Cherr, 2005; DeMarco, Relf, & McDaniel, 1999). Other research focusing on the academic outcomes after school garden participation has found improvements not only in the attitudes of students toward learning, but also in their actual academic achievement in all areas of the curriculum (Faddegan, 2005; Smith & Motsenbocker, 2005; Williams & Dixon, 2013). Among preschool children, gardening has shown to aid in sensory experiences and process learning (Hachey & Butler, 2009). Finally, much of the research on youth gardening programs shows that children develop a greater connection to the natural environment when participating in gardening activities. By increasing a child's exposure to nature through gardening, they are more likely to develop a greater awareness of their environment and adopt behaviors that will protect it (Strife & Downey, 2009).

Programs that have succeeded

Across the US, many schools including elementary, middle, and high schools have participated in instructional gardening programs. One example of a successful school gardening program is the LA Sprouts program, which took place in East Los Angeles, CA. This program took into account the increased risk for obesity among Latino youth of low socioeconomic status (Davis et al. 2011). Elementary school students in fourth and fifth grades took part in nutrition lessons combined with community garden activities over a 12-week intervention period. Each week, the students learned a nutrition lesson and a gardening lesson and then were given the opportunity to prepare a recipe with fruits and vegetables that they grew in the garden. The results of this study showed that the participants improved dietary intake and reduced their blood pressure. The participants also improved their fiber intake on average 22% over the course of the intervention (Davis et al, 2011).

Another example of a successful school gardening intervention took place in southeastern Minnesota and was titled the “Delicious and Nutritious Garden” (Heim et al, 2011). This was a 12-week YMCA summer program in which children in grades 4 through 6 participated in various gardening activities including planting, harvesting, and maintenance of the garden. The researchers found that 99% of parents of the participants reported that their children enjoyed taking part in the gardening activities. In addition, the asking behavior for fruits and vegetables improved among the children after taking part in the intervention (Davis et al, 2011).

Currently, there is very little literature available that has investigated the impact of instructional gardening in a childcare setting. The lack of previous research combined with the need for this specific age group to be targeted for nutrition interventions to prevent childhood obesity makes it necessary for more research to be conducted in this area. There are several curricula available to help implement instructional gardens for the preschool age group, including the “Early Sprouts” program from Keene State University in New Hampshire (earlysprouts.org) as well as the “Grow it, Try it, Like it” curriculum from the USDA’s Team Nutrition Program (USDA FNS, 2010). Although there are these resources available, there is very little evidence that these programs are being implemented or maintained.

There could be several reasons for the lack of program implementation using instructional gardens. These reasons include the actual or perceived barriers such as a lack of time, uncooperative administration, lack of volunteers, or a lack of a master gardener or garden coordinator (Hazzard et al, 2011). According to previous research regarding school gardening programs, educators felt their largest barriers were a lack of funding and materials as well as a lack of training and guidance, which in many cases is provided by a Master Gardener (Dobbs, Relf, and McDaniel, 1998; Hazzard et al., 2011). Although there are many resources that can be utilized for these programs including grants and donations, many childcare providers may be unaware that they exist or lack the motivation to seek them out. The National Gardening Association is a source for a large number of grants annually used to fund instructional and community garden programs. According to

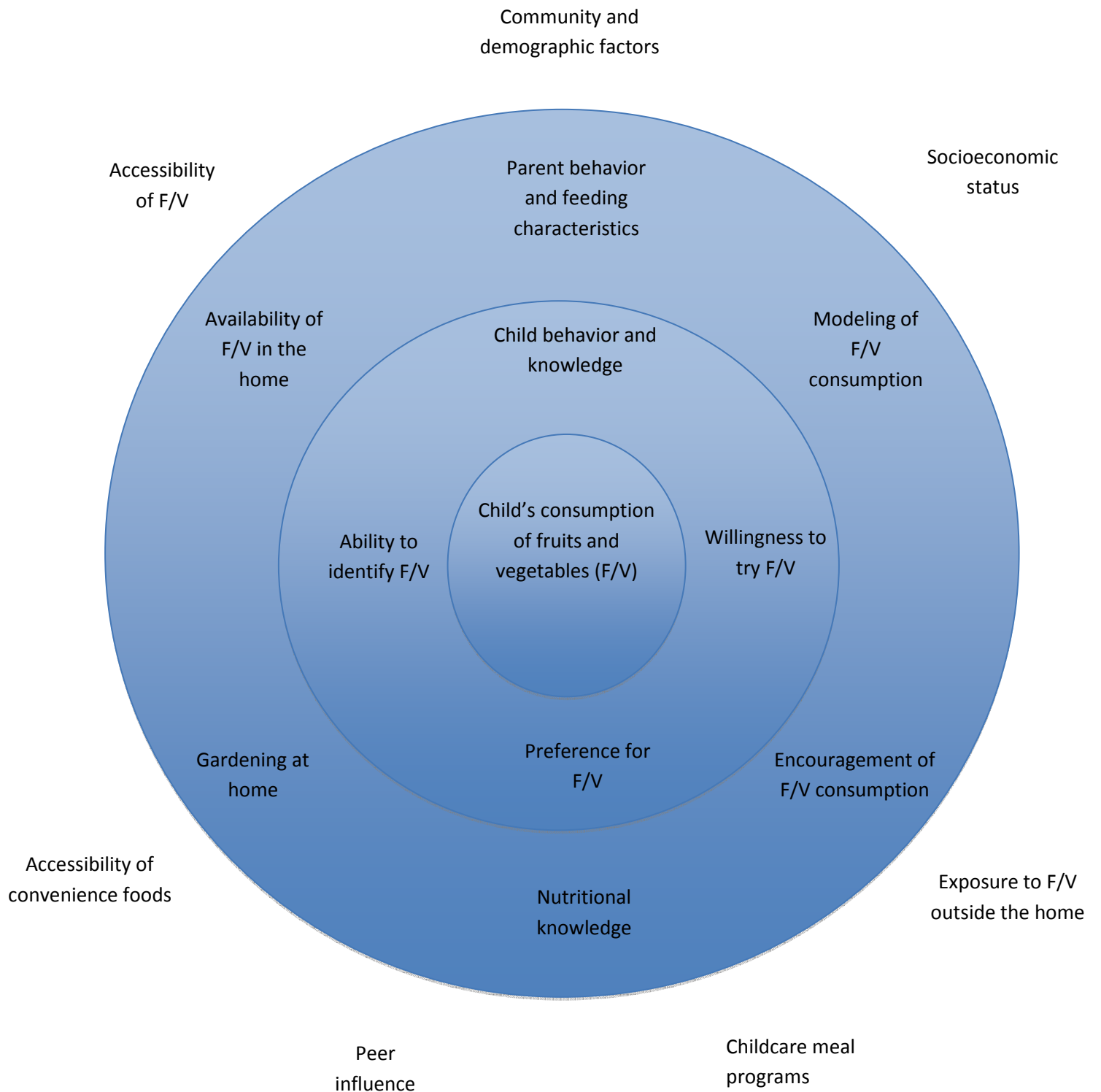
a summary report from this organization, only 8% of their funding was utilized by preschool or Head Start programs in 2011 (National Gardening Association, 2012). Since many of the resources identified as barriers are in fact available and seemingly underutilized, it is necessary to identify whether the lack of instructional gardens among childcare settings is due to a lack of knowledge regarding how to access these resources or if it is due more to a lack of motivation on the part of the childcare provider.

Social Theory

This research study was based on an ecological model that identifies the various influences on a child's consumption of fruits and vegetables. The model shown in Figure 1 is based on a model created by Birch and Ventura (2009) that displays the contexts influencing a child's overall weight status. Figure 1 shows the child's consumption of fruits and vegetables in the center of the model as that is the behavior targeted by this research study. The closest circle to this target behavior shows factors that are unique to the child that have an influence on his or her consumption of fruits and vegetables. These factors include knowledge about fruits and vegetables as well as taste preferences for them. The next level shows influences that occur in the home mainly based on parental characteristics and behaviors relating to food and nutrition. These factors include nutritional knowledge of the parents, presence or absence of modeling fruit and vegetable consumption by the parents, and exposure to fruits and vegetables in the home both in overall availability as well as with experiences such as gardening. Finally, the

outer circle is composed of influences that occur outside the home and are based on overall demographic characteristics of the child such as where they live because this could have an impact on their accessibility to healthy foods or convenience foods such as fast food. The outer level also takes into account influences that occur in childcare settings, which is the main focus of this research study. The types of experiences and exposure the child has to fruits and vegetables while in a childcare setting may have a major impact on his or her consumption of fruits and vegetables.

Figure 1: Ecological model of factors influencing fruit and vegetable consumption among children



This research study addressed several factors outlined in the ecological model including childcare meal programs and accessibility of fruits and vegetables outside the home. The objective of this research study was to gather information on the current use and motivation of childcare providers to implement instructional gardens in order to increase fruit and vegetable consumption among children between the ages of 2 and 5.

Methods

This study was conducted using qualitative data collection methods from a convenience sample of participants.

Recruitment of Participants

In order to recruit participants for this study, researchers utilized an agency called Childcare Solutions. This agency serves as a resource and referral agency for both childcare providers and parents in Onondaga and Cayuga counties.

Researchers were able to obtain contact information including names, phone numbers, addresses and E-mail address for all licensed childcare providers in Onondaga and Cayuga Counties.

Inclusion Criteria

From the list of childcare providers obtained from Childcare Solutions, researchers developed the following inclusion criteria for participation in this study. First, the participant must have been a childcare provider currently caring for children between the ages of 2 and 5 years old. Caring for children older or younger

than this target age group was acceptable, however it was necessary that the children were not exclusively infants or school age. Second, the participant must be a licensed care provider or in the process of becoming licensed by New York State. Original location criteria were limited to Onondaga and Cayuga counties based on the data available from Childcare Solutions. However, based upon a referral for an interested participant in Madison County, the location criteria were extended.

Recruitment

The first method of recruitment for this study was a mass e-mail solicitation to all childcare providers registered with the Childcare Solutions agency. The e-mail was distributed by an employee of Childcare Solutions and explained the purpose of the study, criteria for participation, and information necessary to contact the researcher if interested in participating. Three participants were recruited via the mass e-mail solicitation.

The second method of recruitment was a solicitation letter mailed to randomly selected childcare providers registered with Childcare Solutions. From the list of childcare providers, every third name was selected to receive a letter. This generated 163 names to receive recruitment letters. The letter explained the purpose of the study, the methods by which data would be collected (structured interview), the length of time the interview would take and information to contact the researcher if interested in participating. Five participants were recruited via the recruitment letter.

Following the mailing of the recruitment letters, follow-up phone calls were made to potential participants. The researcher asked each childcare provider if they had received the recruitment letter, briefly explained the study and data collection methods, and asked if the childcare provider would be interested in participating. Four participants were recruited via the follow-up recruitment phone calls.

The recruitment mailing and follow-up phone call were repeated again with a second round of randomly selected names from the Childcare Solutions list. From the remaining names on the list, every third name was selected to receive a recruitment letter. This generated a list of 97 childcare providers. One participant was recruited via the second round of recruitment letters. Three participants were recruited via the second round of follow-up recruitment phone calls.

The third method of recruitment for this study was through snowball sampling. Several childcare providers were referred for this study by other study participants. Four childcare providers were recruited in this manner. A total of 20 participants were recruited for this study.

Population

The population recruited for this study met all inclusion criteria and were divided into four groups based on their childcare setting. These groups were day care centers, family day care providers, group family day care providers, and Head Start/Early Head Start programs. A day care center is defined as a facility that is not a personal residence and offers care to more than six children at a time (NYS OCFS). A family day care refers to providers that offer in-home care to three to six children

at a time with the maximum allowable number dependent on the number of infants, if any, at the day care provider (NYS OCFS). Similarly, a group family day care refers to providers who are also in a residential setting, however they offer care to more than six children at a time. These providers must have an assistant present and the maximum allowable number of children is dependent on if and how many infants are in their care (NYS OCFS). Finally, Head Start and Early Head Start programs provide childcare for infants, toddlers, and pre-school age children and their families in low-income populations. In this study, all Head Start and Early Head Start programs were in a day care center setting.

Of the childcare providers participating in this study, 14 were from day care centers, 2 were from Head Start and Early Head Start programs, 2 were caring for children in a group family day care center, and 2 were providing childcare by themselves in a family day care setting.

Approval was obtained for human research from the Institutional Review Board at Syracuse University prior to the recruitment of study participants.

Data Collection

Structured Interviews

All data used in this study were gathered via structured interviews with the childcare providers. Each participant was given the option of completing the interview in-person or over the phone in order to accommodate the schedules of the participant. A total of five phone interviews and 15 in-person interviews were

conducted. Most in-person interviews were conducted at the childcare site, while one was conducted at an outside location.

The interviews were conducted using a guide divided into three sections; demographic questions, questions regarding dietary habits of the children and fruit and vegetable intake, and questions regarding the use of gardening activities. Complete interview questions are included in Appendix A. The demographic sections included questions about the interviewee's role at the childcare center, how many children are cared for at the site, the age range of the children and how many care providers are at the site. The section on dietary habits and fruit and vegetable consumption aimed to gain information regarding the current dietary habits of the children and how they compare to dietary guidelines, how willing they are to try fruits and vegetables, how important the childcare provider feels fruit and vegetable consumption is for the children in their care, and whether or not they or any other staff has had coursework or training in nutrition. There were also questions in this section addressing how the childcare provider feels that both the home and childcare environments influence the eating behaviors of the children. Finally, the section regarding the use of gardening activities was aimed at gaining information on the perceived benefits and barriers of fruit and vegetable gardening with young children. These questions differed among interviews depending on whether the childcare provider was currently using gardening activities or not. Questions addressed topics such as whether the provider was using formal gardening curricula, whether they had the necessary time and resources to garden including space, tools, and funds, if they felt the children would or do enjoy gardening

activities, if the parents would be supportive, if they would be willing to participate in gardening training and what resources would be helpful to them in implementing gardening programs.

All interviews were recorded using a SONY Digital Voice Recorder. Field notes were also taken during some interviews in order to document information on current gardening activities that were shown to the researcher. Several settings had either photographs of their gardens or seed growing activities that they addressed in their interviews. All interviews were transcribed verbatim by the researcher.

Coding and Analysis

Each transcribed interview was coded using QSR NVivo 10 software. Coding was completed first by separating answers to each interview question into separate codes. Codes followed the same structure as the original interviews, however many answers within each code overlapped. The answers were then coded based on themes and similarities among them. These codes were formed into a hierarchical structure with the original question as the primary code and the common themes creating secondary codes within it. For example, a primary code was “challenges to gardening with young children” and secondary codes within the primary code included “lack of resources,” “pest issues,” and “lack of time.” Analysis of the transcribed interviews generated 14 primary codes and 56 secondary codes. Data that were irrelevant to this study was removed from analysis.

Results

Demographic Information

The childcare providers interviewed for this study worked in various childcare settings. All childcare facilities fit our inclusion criteria of caring for children between the ages of 2 and 5 years, however many also cared for children both older and younger than this age bracket and the number of children in attendance as well as the number of childcare providers at each site widely varied. The type of childcare setting, range in number of children attending each facility, age range of those children, and number of care providers employed at each facility are listed in Table 1.

Table 1: Demographic Information of Childcare Facilities

Type of Childcare Setting	Number of Children Attending (Range)	Age Range of Children	Number of Childcare Providers
Family Day Care	4--7	6 wks.-9 yrs	1
Group Family Day Care	15	7 mos.-11 yrs	2
Day Care Center	18 - 134	6 wks - 12 yrs	4 --40
Head Start Program	143- 368	6 wks - 5 years	70

In addition, participants were asked what their role in the childcare setting was. These roles included director of the childcare center or main childcare provider in a home setting (n=12), assistant director of a childcare center (n=2), Health and Nutrition Coordinator (n=1), teacher (n=4), and teaching assistant (n=1).

Coursework in Nutrition

Of all of the childcare providers interviewed for this study, approximately half (n=8) said they had no previous coursework or training in nutrition. Conversely, the same number of participants stated that they were trained as either a requirement for participating in the Child and Adult Food Care Program or as continuing education training for childcare providers. The remaining participants (n=2) had taken college level nutrition courses through Syracuse University.

Of the individuals that stated they had participated in training programs focusing on nutrition, one was involved in the Eat Well, Play Hard program through the Onondaga County Health Department. Some (n=3) stated their training was done through the CACFP program, while others (n=3) said they participated in training programs sponsored by New York State that were required for their licensing. One childcare provider also stated that she and her staff members took part in training programs focused on nutrition sponsored by Childcare Solutions.

Dietary Habits and Fruit and Vegetable Consumption

Importance of fruit and vegetable consumption

When asked how important fruit and vegetable consumption is for adults, all participants (n=20) answered important. Likewise, all participants felt that fruit and vegetable consumption was equally important if not more important for children. Childcare providers felt that the benefits of fruit and vegetable

consumption for children included (1) providing “good” energy as opposed to “hyper” energy (2) providing vitamins, minerals and other nutrients (3) important for digestive health (4) less irritability, particularly among the younger children (5) developing a taste for fruits and vegetables early in life (6) providing variety to the diets of children and (7) fruits and vegetables are generally easy to handle and eat for young children. For instance:

Well there’s nutritional benefits, there’s health benefits, there’s, it also offers them a variety of foods. I think fruits and vegetables offer a lot of diversity in terms of choices that the kids can make themselves. Also, a lot of those kinds of foods are easy to eat and allow the children to be independent, so that’s a benefit.

Of course it will give them more energy, better brain functioning, um stronger bones and muscles, healthier skin, they’ll sleep better usually, they’re generally less irritable.

In addition to the dietary benefits of fruits and vegetables for children, ensuring these foods are offered at a young age is important for developing lifelong healthy eating habits. For example:

To offer it as young as possible because kids develop their likeness of things young and if they don’t have experience to it until they’re older, they might not like it as much.

I think the earlier they start and it’s just part of their daily routine and it’s something that they, you know, it’s just been given to them since day one. So it’s normal for them.

Types of fruits and vegetables served

When asked what types of fruits and vegetables were served at the childcare facility, most participants offered a list including a wide variety. Fruits served included apples, oranges, bananas, pears, various kinds of berries, and melon. Vegetable varieties included green beans, carrots, broccoli, cauliflower, peppers, squash, spinach, and sweet potatoes. Some childcare providers emphasized providing fruits and vegetables that are in season when possible and providing fresh fruits and vegetables when possible as opposed to frozen or canned. One family day care provider served less common items to the children including dandelion greens, mushrooms, and blood oranges because she felt it was important for the children to be exposed to all kinds of fruits and vegetables.

Willingness to try fruits and vegetables

When asked how willing the children in the childcare facility were to try the fruits and vegetables that are served, the answers among the childcare providers were varied. Some participants felt that it depended on the child, while others felt that it was a struggle to get all of the children to eat the vegetables, while still others felt that overall the children were willing to try the fruits and vegetables served. Many participants mentioned that it was not difficult to get the children to eat fruit because they enjoyed the taste of it more than vegetables or they were more familiar with it. However, they felt that the vegetables were much more of an issue.

Several childcare providers discussed the practice of a “no thank you helping.” This means that when meals are served each child is asked to take at least one bite of each food. According to several participants, children are likely to say that they don’t like a certain

type of food before they have tasted it. They have found that when the children try the food, they often do like it and are more willing to try it in the future. In addition, most childcare providers interviewed understood that it may take exposing a child to a certain food several times before they are willing to try it or decide they like or dislike it. For instance:

They tend to try it; just exposure is a big thing. Just continuously exposing it, sometimes doing it a little differently. Like we've kind of done like a green eggs kind of thing, which is a broccoli and eggs and cheese mixed in.

It was also noted by several childcare providers that the younger children they care for are more willing to try the foods offered because "they don't have any preconceived notions of what it might taste like." In addition, several participants noted that children are more willing to try certain foods, including vegetables in the childcare setting than they are home based on feedback they received from parents.

Meeting fruit and vegetable recommendations

Out of all of the childcare providers interviewed, most (n=19) said that meals and snacks are provided to the children by the childcare facility or family day care provider. Only one childcare facility did not provide meals and snacks, instead the children brought their food from home. Of the providers that did serve meals and snacks, some are participating in the Child and Adult Care Food Program and of those that are not, most said they still followed the guidelines set by the USDA for nutrition recommendations.

Using CACFP standards, even though we're not part of the program yet, we have to give them a certain amount, present a certain amount to them. Um, so it's a lot more balanced of you know having fruits and vegetables since we have it incorporated throughout our day with every meal, um I think we give them what they would generally need for the quantity that they need for the time period that they're here. And some children could get here as early as having breakfast here to then they go home to have dinner.

When asked whether they felt the children in their care were meeting recommendations for fruit and vegetable intake, the answers from participants varied. Some felt that the children were meeting recommendations for what they should eat while they were in the childcare setting while others felt that even though the proper amounts of fruits and vegetables were served, the children were not eating them and therefore not meeting recommendations. For example, different childcare providers said:

They're served the recommended amounts, but they do not eat the recommended amounts.

As far as from us, they get what they need daily from us. We have a set schedule as to how much they have to consume per day. Obviously, you know, they don't always eat it, but they're served what they should be getting from us on a daily basis.

Influence of the home and childcare environments on eating behaviors

Childcare providers were asked what kind of influence the home environment had on a child's eating behaviors. Many felt that children were eating less healthy at home than they were in the childcare setting for several reasons. One reason was that parents are very busy and their hectic schedules can lead to less healthy eating behaviors. One childcare provider said this:

I think we all live in a fast-paced world so I, you know, I sense that, I see sometimes children are coming to school with a fast food breakfast. I know some of them leave here to go to McDonald's for a Happy Meal.

Other providers said they felt that parents were more likely to give in to their child at mealtime in the form of offering food that the child wants or giving snacks late at night because the child didn't eat dinner. For instance:

I think most parents want their children to eat healthy, but I know that they also are at a different mindset that we are where they just, you know, kind of want low drama and maybe give in a little more than we do.

One provider also said that she was aware of parents disguising healthy food such as fruits and vegetables in order to get their child to eat them and she felt that discouraged the child's willingness to try these foods in their natural form.

Similarly, all childcare providers interviewed in this study felt that the childcare environment and the childcare providers had a very large influence on a child's eating behaviors. However, the way in which they felt the children were influenced by this environment was very different than how they described the home environment. Factors that were mentioned in relation to this included (1) family-style dining and the influence of teachers and peers, (2) exposure to a wider variety of foods, (3) guidelines provided for healthy meals (4) the number of meals and snacks served in the day care setting, and (5) few substitutions at mealtime.

The two most common topics discussed by childcare providers when asked how their environment influenced the eating behaviors of the children they cared for were the aspect of peer pressure on a child's willingness to try new foods and family style dining, a

practice carried out by all except two of the childcare providers interviewed. The participants interviewed felt that in the childcare setting at mealtime when all of the children are eating the same foods, children are more willing to try new foods, particularly fruits and vegetables. One participant said this:

I think it's important to have us all be together and all, I think having everyone eating the same thing makes a big difference in getting kids to try things that they wouldn't try otherwise.

Several participants described this as “positive peer pressure.” In addition, the family-style dining aspect of most childcare settings (n=17) added an opportunity for teachers and other childcare providers to practice positive role modeling as well by trying the foods that were served. Participants also explained how family-style dining offered a learning experience for the children as far as dining skills including using utensils, taking appropriate portions, and socializing with their peers at the table. Participants discussed how important it was for the childcare provider to offer positive encouragement to children during these meals and how that had a very large impact on the child's eating behaviors. During mealtimes, several childcare providers said it was an opportunity for the teachers and children to talk about the food they are eating both from a sensory standpoint (touch, smell, and taste), but also to learn information about the food such as where it comes from and how it grows. In addition, some providers took these lessons even further and incorporated food into aspects of the curriculum at other points during the day. For instance:

The menu might have something on it for lunch and then they get to do like an afternoon activity where they dissect it. Like let's say it's a pineapple, you know, we have pineapples for lunch, but look, this is a pineapple and they give little tidbits about it like where they're located, you know, and then the kids learn all about the fruit or the vegetable.

Another influential factor in the childcare setting on eating behaviors that some interviewees discussed was the increased exposure to foods that children had in a day care setting. Several participants felt that the childcare setting offered a wider variety of foods than many children are offered at home including many fruits and vegetables. In addition, most childcare facilities (n=19) were providing the food for the children and following some form of nutritional guidelines in line with the USDA's dietary recommendations. Most participants emphasized serving fruits and vegetables with meals, usually a fruit with breakfast, a fruit and at least one vegetable with lunch and often a fruit or vegetable with the afternoon snack. Childcare providers felt that it was important to offer a wide variety of healthy foods that included fruits and vegetables because of the amount of time the children spent in their care and the number of meals they consumed in this setting.

A final aspect that childcare providers felt was an important influence on eating behaviors of the children was that there is little opportunity for food substitutions at mealtime. Unlike in the home environment where many providers felt that parents were "giving in" too often or providing too many substitutions so that children weren't trying new foods, in the childcare setting researchers were told that it is too difficult to offer many substitutions so children generally will eat what is being served. An exception to this was in the case of food intolerances, but most providers felt that it was important to have children on the same menu, eating as many of the same foods as possible.

Overall, childcare providers felt that both the home and the day care setting were had a very large influence on the eating behaviors of children. The influence of the home environment was described by most providers in a somewhat negative manner while the childcare setting seemed to have a more positive influence on the children's dietary habits.

Gardening in the Childcare Setting

Current Use of Gardening Activities

Of the childcare providers interviewed for this study, more than half (n=14) were currently using gardening activities in their childcare facility. Of these participants, all except one had implemented and continued gardening programs for several years. The remaining participant had completed the gardening program for the first time the previous summer and was planning on continuing it in the coming spring. The other participants (n=6) were not currently using these activities, but all expressed interest in implementing a gardening program in the future or had already taken some preliminary steps in doing so.

The gardening activities described by the childcare providers included (1) seed sprouting, both indoors and direct planting outdoors, (2) maintenance of the garden, (3) harvesting, (4) lessons involved in the garden and, (5) play in the garden.

All current gardening programs involved seed sprouting with the children. In some cases, this was done in the classroom in preparation for the plants to be transferred to the garden outdoors and in other cases, the children were able to direct seed into the garden outside. For two participants, they currently did not have an outdoor garden space, working together, they created indoor seed sprouting activities including using plastic bags

and CD cases to sprout bean seeds and mini green houses made out of recycled rotisserie chicken containers to sprout corn plants, both of which the children brought home to plant.

Other participants described creating packages of seeds with plant markers on which the children could write their name. The children were instructed to plant the seeds directly into the garden and mark them with their name so they were able to track their progress alongside their peers' plants.

Using formal gardening curriculum

Currently, very few of the childcare providers interviewed were using a formal gardening curriculum with their program. Only one provider said she had accessed materials from a program developed by the USDA called "Grow it, try it, like it" for use with her gardening program. Two other participants said they had used the "Early Sprouts" curriculum in the past, but were not currently using it. A fourth participant modeled her gardening program after a curriculum developed for Montessori schools that she had used while teaching in that setting. All other childcare providers who had implemented gardening programs were not using any kind of formal curriculum, but instead relied on themselves or other staff members to create the activities. For example:

We just kind of put things together, yeah. From things that she saw or things that I saw and we went and researched different activities that they could do to strengthen the lesson and the science behind it.

Several interviewees felt that there would be a great benefit to using a formal gardening curriculum both for the children and for the staff, they were however unaware of curriculum resources that were available for this age group.

Necessary Space for gardening

When the participants were asked whether they felt they had enough space to accommodate their current gardening programs or those they planned for the future, most (n=19) said they felt they did. One participant said her location did not offer a lot of green space and that might be an issue for a gardening program. The amount of space that each location had varied greatly as did the use of the space available. One participant was located in a semi-rural setting and felt that they had ample room to set up gardening areas. While others in more suburban and urban areas have or plan to have their gardens located in backyards (n=4), in courtyard areas (n=2), or on playgrounds set up as container gardens. One childcare provider explained that in order to get the most use out the space they currently have, she plants two separate crops, one early in the season and one later in the season using the same space.

Necessary Time for gardening

Most childcare providers (n=18) felt that they would have the time during the day to devote to gardening activities with the children. Most felt that during the spring and summer months, it could be incorporated into the time already spent outside. Some childcare providers, particularly those in home settings expressed that they had the ability

to devote more time to gardening activities because they did not have a set schedule to adhere to. In the day care center settings, providers were more likely to say that due to scheduling restraints, time for gardening would not be unlimited, however they felt confident that it could be worked into the daily routine of the children. One day care center provider said this:

That's what I love about this age is we really have a freedom with our curriculum. I mean we do have the core curriculum that we follow as well, but we have more time to do those kinds of things and activities and it reinforces what we're learning in here everyday.

Another participant commented on the general tasks required of teachers throughout the day that could allow for less time for gardening:

It's hard with all the different things that teachers are responsible for besides you know the everyday meals and washing hands and toileting and reading stories and taking naps. Their day goes by pretty fast and how to fit in, you know, what's a reasonable, realistic amount of a new thing to add to their day. So generally it would come in their gross motor time when they're playing outside, but you know, there's still talking to parents when they come to pick up and helping them get into the bathroom and drinking water, the time goes by pretty fast even for that.

Tools necessary for gardening

When asked if they had the necessary tools and equipment for a gardening program, a majority of the childcare providers (n=16) said they had enough, but several of them would like to purchase more, particularly those that are an appropriate size for young children. The remaining participants (n=4) did not currently have the tools necessary for a gardening program. One childcare provider mentioned that with their gardening program,

they use very few standard gardening tools, but instead have the children dig, plant, and weed in the dirt using their hands.

Willingness to participate in gardening training

The majority of childcare providers interviewed said they would be willing to participate in gardening training if it was offered to them. Many working in larger day care centers also felt that most other staff members would be willing to participate as well. One participant was unsure whether overall it would be necessary or beneficial to participate in gardening training, but she said that for some individuals with little to no gardening experience it would be helpful. Other participants stated that they have one or more staff members who are very knowledgeable about gardening, but that it would be very beneficial for those who aren't to participate in further training.

Parent Support

Participants were asked whether or not they felt parents were supportive of current gardening programs or if they would be supportive if one were to be implemented, they all said that they felt parents would be supportive. Many shared that in their experience, parents were often willing to donate time and materials to gardening projects. However, one childcare provider stated that she felt parents would be supportive of a future gardening program as long as they were not required to contribute any extra funds to the program.

Others were able to influence parents to begin gardening with their family outside of the childcare setting: “Two of our Early Head Start parents this year planted their own plot in the city garden.” Childcare providers working in the Head Start and Early Head Start programs felt parents support the gardening programs and that parent involvement could be heightened through the use of monthly meetings, which they are required to attend.

Funding

Most participants discussed at some point during their interview the issue of funding in relation to implementing gardening programs. Some had been awarded grants in order to aid with implementation while others were interested in learning more information about what funds were available to childcare providers for these programs. Still others, particularly family day care and group family day care providers were using their own funds in order to supply materials for the gardening activities.

Of the 20 childcare providers interviewed for this study, four discussed grants that had been made available to them in order to aid in implementing their gardening programs. Both Head Start/Early Head Start programs were given grants, one from the Food Bank of CNY and the other a \$5,000 grant from the Head Start program. A third day care center was awarded a grant to start a gardening program from the Onondaga County Health Department and finally a fourth day care center housed within a Jewish Temple will be collaborating on a gardening program using a grant awarded to the Temple community.

Factors preventing gardening program implementation

When the childcare providers who were not currently participating in gardening programs (n=4) were asked what factors might prevent them from implementing these activities, they mentioned time, money, and space. All of these participants felt that they would be able to find the time for gardening activities throughout their day, however at times it may be a struggle. Space was an issue for one participant in particular due to the location of the childcare center that did not offer very much green space as it was surrounded mostly by parking lots on all sides. For another participant, she felt she had adequate space for building a garden, however she was concerned with it being too close to the children's play area and becoming damaged. Finally, funding was an issue mentioned by several childcare providers as a factor that might hinder garden implementation. One participant felt that once the garden was established, the costs of maintaining it would be feasible, however she was concerned about the initial costs of building the space.

Benefits of gardening with young children

Childcare providers were asked what they felt the benefits to gardening with young children, specifically in the targeted age group 2 through 5 years, was and their responses encompassed a number of nutrition-related and non-nutrition related benefits. The health and nutrition related benefits included the following: (1) food from the garden for consumption, (2) Increasing exposure to and willingness to try fruits and vegetables, (3) increasing knowledge about food and where it comes from, and (4) encouraging physical activity. Other non-nutrition related benefits that were described included (1) gardening

activities are beneficial for all ages, (2) encourage a connection to the natural environment, (3) enjoyment of children, (4) valuable learning experiences, (5) ability to incorporate gardening into other aspects of the curriculum, (6) marketable for childcare facility, (7) teaches responsibility and encourages a sense of accomplishment, and (8) the ability to share the gardening experience with the children's families.

The first major benefit participants mentioned was offering the children the ability to eat the vegetables they grew and harvested. Some gardening programs produced enough harvested product for use in the meals at the childcare facility while others allowed children to graze in the garden on items such as beans and even some herbs or bring them into the classroom as a snack. One participant said this was a benefit because, "they've seen every aspect of the growth process even to consumption." Another teacher described how eager the children were to eat the vegetables: "Sometimes we've brought them in and before we could get them to the kitchen they would say 'can we wash them and eat them raw?'"

A second nutrition related benefit of using gardening activities with young children was that childcare providers found that it increased exposure to fruits and vegetables as well as children's willingness to try them. Some participants observed children eating certain vegetables in the garden that they had a history of turning down at mealtime. For example:

They were wanting to eat things that when they're presented on a table, they're not interested in. I mean they saw it come up, like chives. So they were always wanting to eat the chives, picking the chives, anything that popped up, like radishes.

Childcare providers felt this was for several reasons. One reason was that they felt children were more likely to eat foods if they had grown it themselves because they were more connected to them. Another reason was that the providers felt the food tasted better out of the garden and the children were able to eat the vegetables right after picking them.

Another benefit described by childcare providers was the increase in knowledge that came along with gardening activities. Participants felt that this was important for the children, but also for the parents who may not have the knowledge related to how food grows or where it comes from. Many participants felt that children were not aware of where food comes from and that it was important to learn and have an appreciation for it, which they were able to encourage by gardening with the children. One provider described a related experience this way:

Children don't know where food comes from. They go to the grocery store and um, there was a student who was talking about homophones to one of my teachers and she was like, I can't remember the example she used, but then she was like "there's chicken, like the chicken that you eat and chicken like the bird." The teacher was like "actually, those are the same thing." You know there are stories about kids not wanting to eat carrots because they have dirt on them and it's like guess what, all our food comes from the dirt.

Other providers were able to extend the gardening experiences and allow children to view how the food served at their facility was prepared so they were able to see the entire process from start to finish. This aspect of increasing knowledge through process learning was mentioned by several of the participants as being extremely important for this particular age group.

While encouraging overall health and nutrition was emphasized as a benefit of gardening with young children based on increasing their appreciation and willingness to

try fruits and vegetables, some participants also described the physical activity involved in gardening as an added benefit. One teacher described her experience: “It got them moving, so that was good. It got them moving, you know digging, using all those muscles.”

In addition to the nutrition and health related benefits of gardening for children, participants described a number of non-nutrition related benefits as well. Several providers mentioned that gardening is an activity that can be done with children of all ages. Although the actual use of the garden may be different among the age groups, for instance while some children may be able to be active in the actual planting and maintenance of the garden, many providers felt that even the youngest children benefitted from simply being exposed to the garden and being present while other children were gardening.

Another benefit according to participants was fostering a connection to the natural environment. Many providers spoke about the ability to use gardening as a way to teach children about life cycles, growing, and the environment around them. For instance:

We really strive to connect children with nature and that’s a really good way to do it because obviously we can bring dirt into our classrooms and then there’s the same connection to go outside. So we try to just help them get connected to nature so that they’ll care about it and they’ll have the experiences.

It makes them learn about the environment and outside and how things grow. And just kind of how the life process of a plant works.

A major benefit to gardening with children that participants described was that the children really enjoyed the experience. Aspects of the experience that children really enjoyed included the hands on activity, watching the plants grow and observing changes everyday, and having a personal connection to the plants they grew themselves. Many

childcare providers simply said the children had fun with the gardening activities. Some examples of experiences are described here:

Some of the kids really gravitate to the garden. They like to go sit on the edge and look for the beans, it's just another focus area for them so it's pretty neat.

There's something pretty magical about putting a seed in even though they have, they don't have a concept of time yet, the younger children, but then to be able to go out and harvest those cherry tomatoes was pretty magical for a lot of the children.

When they first sprout, they're so engaged in it, I mean totally engaged that we get excited with them.

A fourth non-nutrition related benefit that was described by all of the childcare providers was that gardening with young children offered them valuable learning experiences. Some participants described children in their care that have gardening experiences at home with family members, but for the most part they felt that this was a new experience for the children and one that they may not get anywhere else. One provider said:

Life experiences, maybe if their parents don't have a garden, something that they can do here especially if they live in an apartment, they're not going to get the experience of gardening.

Many participants also felt that having these experiences at this young age was important. One participant said:

I think if it's carried through, it starts off young and it's carried through over the years, then it becomes like a lifelong learning experience for them, you know. I don't know if they're going to specifically say when I was three, I did this, but along the way, it will carry over.

Most childcare providers felt that they currently were able or would be able in the future to incorporate gardening activities into other areas of the curriculum. Some participants described using gardening activities in math and science lessons. For example:

It's a great math activity because you can graph it and you can put quantities to it. You know, how many beans did they get today. You can do the science aspect, you know, what do plants need to grow.

Many participants also emphasized gardening as a sensory activity for young children. One childcare provider said this:

If you look at gardening from a sensory aspect, I mean from an early childhood standpoint, sensory is great for kids. You know, they need that tactile thing, they need that feeling so to feel the dirt, to feel the water, to you know, that's a great sensory activity.

Another benefit of implementing gardening programs in childcare settings as described by several participants was that it is a marketable aspect for the day care center or home day care operation. Several of the providers who currently had successful gardening programs used it as a selling point when promoting their program to potential enrollees. Other providers who were looking to implement a gardening program in the future also said they planned on using it as an integral part of marketing their program. For example:

From a marketing standpoint, from a selling standpoint, it's huge for us because we can say, here's something the kids are doing and I can go into all that early childhood stuff with them. You know for us it's a selling point, for the kids it's a win, for the teachers it's a win.

Many of the participants described the opportunity to teach kids responsibility and encourage a sense of accomplishment as a major benefit of gardening activities. One participant described it as the children having "a sense of caring for something." Childcare providers also said it was an opportunity to teach consequences as they relate to responsibility. The children had the responsibility to take care of the garden including weeding it and watering it, and on some occasions saw the consequences of not following through with those tasks and responsibilities.

Participants also said that the children had an immense sense of pride and accomplishment when they did care for their plants and were able to see the end product. One teacher felt that it "gives them self-esteem" while another said "I think it gives them a real sense of accomplishment that they did something on their own."

Finally, sharing gardening experiences with families was a benefit that many childcare providers mentioned. Some did this in the form of actual harvested produce, while others had the children bring plants home that they had started from seed in order to plant in their own yard. The gardening programs that were particularly successful with their vegetable yields were able to offer them to families to bring home. For example:

The kitchen staff made up little packages and sent it with the home visitors who went to the homes weekly and just sent stuff home and they'd send recipes so that they knew how to prepare or cook it.

The kids would bring it in and we have this wicker basket and they would pick, pick, pick and they would just use this basket right by the front door and make a homemade sign, "Please help yourself," and it was kind of neat. Staff would take the stuff home and our security guards, our parents.

Challenges of gardening programs

In addition to the numerous benefits participants described to gardening with young children, they also listed a number of challenges they encountered. These challenges included the following: (1) design challenges, (2) lack of resources including curriculum, knowledge, financial, and volunteer resources, (3) lack of staff support or participation, (4) lack of time for gardening activities, (5) pest issues, (6) weather, and (7) low yield. Several other challenges that were described on an individual basis included maintaining interest in the gardening activities, keeping activities in line with state regulations, and maintaining organization with the activities.

One challenge that was described by some participants was designing garden areas that were functional and conducive to using them with young children. One participant described a gardening area used for a winter garden that was similar to small greenhouses made out of metal hoops and thick plastic designed to protect the plants from the elements. The issue she found, however, was that while the design of the greenhouses protected the plants, it made it very difficult for the children to gain access to garden. Another participant tried using fencing in order to keep animals out of the garden area, but found the same problem that it made it very inconvenient for the children to then utilize the garden space. Her solution to this was to use herbs as a natural pest deterrent, but then found that the toddlers utilizing the garden trampled over them. Other design and location

issues included destruction of gardening areas by maintenance crews or finding a space that offers enough sunlight throughout the day for the plants to grow. One provider said:

Actually I'd say our biggest challenge is the location. Um, our backyard is on the north side of the house and it's trees on either side to the east and west and the house is to the south so it's like back as far as it can go.

Another major challenge described by most childcare providers was a general lack of resources. One specific resource that was mentioned was a lack of curriculum resources to use with the activities. Some providers were not aware of curriculum resources to use and felt that translated into a larger burden on the childcare staff in order to plan activities for the garden. Another resource mentioned was a lack of knowledge resources on the processes of gardening and how to be successful. Several participants explained that they were fortunate enough to have a staff member who was very knowledgeable in regards to gardening activities, but other facilities did not have knowledgeable staff members and felt that they did not know how to go about many of the tasks involved with starting a garden. They also mentioned that they were unaware of where to find resources to gain knowledge about gardening with children. A lack of financial resources was also mentioned as a challenging factor for some. One provider said this: "you get a lot of bang for your buck, it's just hard to find the buck." Finally, a lack of volunteers to help with maintenance of the garden, particularly on the weekends was a challenge for some programs. Due to the need for constant watering in the summer months, some facilities that were closed on weekends or for longer periods of time over the summer felt it was difficult to maintain their gardens without outside help from volunteers. For example:

It's got to be the ongoing and the watering on the weekends. I mean that's another thing I think that's hard now that I think about it. I mean there's two days when nothing can get watered because we're not here. So that can be, in the heat of the summer, that can really set some things back.

Several participants also explained that a major challenge for them was a lack of staff support or participation in gardening programs. Mainly childcare providers in the role of director felt that although they had set up a great gardening program, it was difficult to gain the benefits from it or follow through with it if the other staff members were unwilling to participate. For instance:

A teacher has to be comfortable with making the time to get out to the garden. We have two raised garden beds and one looks like a weed patch and the other, you know, has the remnants of the cherry tomato plants and some lettuce and some cucumber vines and so...I can encourage it all I want, but unless they're watering the plants then it's not going to, it's not going to happen.

A perceived lack of time was another challenge described by several participants. This included both the lack of time during the day for gardening activities as well as the lack of "growing" time throughout the season in Upstate New York. For example, one provider said:

It's difficult because we don't have a good time frame so that's why this winter garden would be good because it would be during, they would see what the results of their work are.

The lack of time described by several participants was somewhat in contrast to the responses given earlier when asked whether they felt they had the time to commit to gardening activities. Many childcare providers felt that they could make the time for

gardening programs, however it would be a challenge to do so. One participant explained her experience:

I would say because people are working and they don't stay here with children if they are working full time. And much of the time really for very little ones is used in daily care giving. You know, feeding, diapering, offering activities, and getting prepared.

A key challenge experienced by almost all of the participants who currently had gardening programs was the issue of pests. For some this included deer, rabbits, and other small animals, while for others it included insects that posed an issue when the children were in the garden area. One provider said this about the challenge of pests in their garden:

We struggle a little bit with little animal friends who also like our garden. But whereas we want the kids to be really hands on with the garden, be able to actually get in there and pick and what not, we don't want to surround the little garden with like chicken wire.

As far as pest control, participants felt it was difficult to find a successful method that was still safe for the children to be around. For example, some did not want to use heavy doses of chemicals that they felt might be harmful to children when they are in the garden. Some providers had tried methods such as small fences that still allowed access to the garden or using natural deterrents such as intermixing various herbs within the garden or even placing bars of soap around the garden to discourage the deer from eating the plants.

Weather was an additional challenge described by childcare providers. Many explained that watering the garden enough became an issue during periods of extremely

hot and dry weather. In addition, some said extended periods of rain could pose a problem for their gardens as well. One teacher simply stated, "You're at the mercy of nature."

A further challenge mentioned by some participants was having a low yield from their garden. They felt that it was difficult and disappointing for both children and care providers when they had put effort into growing something and it didn't grow or did not reach their expectations.

In addition to these challenges, some childcare providers experienced individual trials. One childcare provider said that a challenge she experienced was in maintaining the interest of the children in the gardening activities.

I'll say in the beginning of time, the children were real interested in planting it and you know, we were cultivating it and you know something popped up, but then as the summer went on or the late spring went on, um they just simply kind of, some, not all, some lost interest and I think it was a little too big. So then it became my responsibility, but then um, so then it wasn't that much fun anymore and they kind of lost interest in it.

Another felt that maintaining organization with the activities and containing the mess involved was a challenge for her. Still another childcare provider presented a rather unique challenge of the New York State inspectors not allowing her to have certain types of vegetable plants in her childcare facility, particularly tomatoes, because parts of the plant could be poisonous. She described her experience:

The difference also with well, the family day care is the state regulations around what kids are allowed to have access to. The, you know, I was told that I couldn't have tomato plants around my kids, which I was shocked because I grew up loving to eat tomatoes off the tomato plants and so I was kind of told well, I could put them out, but they'd have to be in a pot so I could pick them up and move them.

Finally, another participant, who had a particularly successful garden, described waste as being a challenge in the beginning of their program. She has since found ways of eliminating this as an issue, but she said this about the challenge:

The first year we had it a lot went to waste it seemed because people, by the time, people didn't want to use it or didn't know how to use it, so it was a learning experience that we said this year that was our goal, not to let anything go to waste.

Although there were a number of challenges listed by childcare providers, many of them were using these challenges as a learning experience either to improve upon their program in the future or as a lesson for the children. For example:

If you think about a teachable moment, you know sometimes my teacher Ernie would go out, he'd say "Uh, looks like we had some friends come in and have lunch in our garden" and follow up and read *Peter Cottontail* or something like that. So they get that too, that's a whole part of nature.

Resources that would be helpful

When participants were asked what resources would be helpful to them in implementing or continuing a gardening program with young children, many of them had similar answers. There were five main resource categories that their responses fit into which included: (1) information and knowledge about gardening, (2) curriculum materials and lesson plans, (3) community support, parent involvement and volunteers, (4) funding, and (5) gardening tools and equipment.

The most common response childcare providers gave when asked what resources would be helpful to them was information and knowledge about gardening. Many of the participants explained that they were very motivated to implement a garden in their

childcare, but they were not confident that they had the knowledge necessary to make it a success. For example:

I don't know a lot about vegetable gardening. I'm learning. I've only done a couple of things. I would like to have maybe a book or something specifically what to do for children.

Other resources that many participants felt would be beneficial were curriculum materials and lesson plans for gardening programs. Many felt that it would ease the burden placed on teachers to create activities for the children and it would provide a more structured plan for the activities with defined goals. One provider mentioned:

I think if there was just a solid curriculum, just on you know, taking it from the garden right through to the child's plate, that would be outstanding. That would be very beneficial.

Several childcare providers also felt that educational materials such as books to use with gardening lessons would be very beneficial in helping the children get the most out of a gardening program.

Participants expressed that while having experienced support from the community in implementing their gardening programs such as support from Cooperative Extension organizations or local businesses, many felt that more community support would be beneficial to the continued success of their programs. One participant described in the past having a local business, Wegman's, donate the rotisserie chicken containers that she used to build mini greenhouses for the children.

In addition, some participants felt that an increase in parent support and involvement would be beneficial. One provider thought of creating a community garden on

their grounds for use by both the children and their parents as a way of involving them more in the program. She said this:

We've even sort of thought of having, offering a sort of activity for parents so that you could have a community garden here where they could come and work and play in their garden with the other parents. Because what we find with our young families is that they have very little time for socializing and that's sort of a nice opportunity to be with other young parents.

Others thought maybe sharing recipes with families for the food the children were growing in the childcare setting would be a helpful way to get families involved more and strengthen the gardening programs.

Many childcare providers mentioned the need for volunteers whether parents, other staff members, or community members to help with the set up and maintenance of the gardens. As previously mentioned, finding time or individuals to water and maintain the gardens when the day care facilities were closed was a challenge for many providers. They felt that If they had more volunteers to share the responsibility, the gardening program would be more successful for the children.

Help with initial set-up

Some participants described having help with their initial set up through either the maintenance staff at their facility or through the grants they were awarded for their gardening programs. However, several childcare providers, particularly those in home day care facilities or smaller day care centers said that having more help with the initial set up would be a beneficial resource for them.

Another resource participants said would be helpful in implementing a gardening program was funding. Some felt there was room in their facility's budget for the materials needed to start a garden, however others felt that there was not a lot of money to set aside and funding in the form of outside grants would be very helpful for them. Most participants felt however, the programs could be carried out very cost effectively and the initial costs of starting up would be the largest.

Some providers mentioned gardening tools, particularly those that are child-sized would be a helpful resource for their gardening program. Several said that while they did have some of these tools already, they did not have enough for all of the children and that they would like to have more. One participant also mentioned that having access to seeds would be a helpful resource as she found that to be a large expense in her program. Another provider said that storage for gardening materials would be a resource she would like to have in order to be able to maintain all of the tools and equipment and keep it organized.

Several other participants mentioned that indoor gardening materials would be helpful in order to make the most of the short growing season in Upstate New York. They also felt it would be a beneficial experience to be able to do more gardening in the classroom. For instance:

If it was something like in the rooms, the visual and they could see the process and kids could say, "Hey, come look at our tomatoes today or cucumbers" or something like that, it would be good.

Since most participants who were gardening described pests as a challenge in their gardening program, many also mentioned means of safe and natural pest control as a

resource that would be helpful. Most participants felt the most effective way to do this would be fencing, but some said they would be interested in learning about other methods of pest control that would be safe to use around the children while still being effective.

Finally, because of the fact that outdoor space was an issue for some participants, several childcare providers said that any equipment or resources that would help them to make better use of their space would be helpful.

Discussion

Dietary Intake of Preschool Age Children in the Childcare Setting

There were several emergent themes from the qualitative data collected in this study. The first group of themes revolved around fruit and vegetable consumption among children in the target age range, 2 to 5 years old. All of the childcare providers interviewed expressed that fruit and vegetable consumption is extremely important for both children and adults. Many, however did not feel that the children in their care were necessarily meeting the recommendations for fruit and vegetable consumption. This finding is consistent with preexisting data on fruit and vegetable consumption among preschool age children. Fox et al. (2010) found that more than 25% of children between the ages of 2 and 3 years old were not consuming a distinct serving of vegetables at least once a day. This is significant because although many participants of this study were following the dietary guidelines required by the Child and Adult Care Food Program, which includes providing two servings of fruit and/or vegetable at each meal, overall, many children were not consuming these amounts (based on observations made by childcare providers). Many of the participants of this study expressed that children's willingness to try fruits and

vegetables is what ultimately dictated their consumption of these foods more than their access to them.

This study used an ecological model identifying various factors influencing a child's fruit and vegetable consumption that is shown in Figure 1 (refer to Background and Significance). This model was based on one created by Birch and Ventura (2009) that displays the factors that influence and are related to a child's overall weight status. In this model, both the home environment and the environment outside the home, which in this case includes that of the childcare facility, imposes an influence on a child's consumption of fruits and vegetables. The model was consistent with the findings of this study in that most childcare providers felt that both the home and the childcare facility had a very large impact on the eating behaviors of the children. Many felt that children were not necessarily eating very healthy at home. They felt this was reflected in the child's willingness to try certain foods, particularly vegetables, in the childcare setting. They also saw evidence of the home eating environment in the food items children brought with them to the childcare facility. These findings are consistent with those of Lynch and Batal (2011). While investigating the factors influencing food and mealtime decisions by childcare providers, they also found that many providers felt the home environment often negatively influenced children due to a lack of exposure to healthy foods and modeling of unhealthy behaviors. Participants of this study also felt that due to these negative influences in the home environment, it was very difficult for them to make any positive changes in the children's diets (Lynch and Batal, 2011). In contrast, the participants of the current study felt that it was their responsibility to make a positive impact on the dietary habits of children if they felt the child was being negatively influenced at home.

Most participants in the current study described the childcare environment as a very positive influence on the eating habits of the children. They felt that certain aspects such as family-style dining provided a subtle sense of peer pressure for children to try different foods as well as encouragement and positive modeling from the childcare providers.

In addition, childcare providers felt that their role in the dietary habits of children was extremely important due to the amount of time the children spent in their care. Some providers said that many children were present in the daycare for breakfast and lunch as well as an afternoon snack. Previous research suggests that these factors combined provide a great deal of opportunity for nutrition-related interventions in the childcare setting in order to promote healthy eating and prevent childhood obesity (Story et al.)

Benefits of Gardening in the Childcare Setting

The benefits of gardening with young children as described by childcare providers included both nutrition related benefits as well as non-nutrition related benefits. The nutrition related benefits of gardening programs could also be explained using the ecological model previously described. On the first level, childcare providers described all of the factors shown in the model as being effected by gardening programs. They felt that the children's knowledge regarding fruits and vegetables as well as how food is grown was increased after participating in gardening activities. Other research examining the knowledge of food origins among preschool children has had similar findings. Children who previously had very little knowledge of where their food originated increased their

knowledge greatly after participating in school gardening projects and local farm visits (Kos and Jerman, 2012). Many also described that children had an increased willingness to try fruits and vegetables as well as an increased preference for them. Some providers said that after gardening with the children, many of them would eat foods, particularly vegetables that they never would have tried before. These findings are consistent with previous research examining the effects of gardening programs with children (Gibbs et al. 2013, Heim et al., 2011). Although much of this research has focused on older children, the data collected from the current study make it possible to extend these findings to include preschool age children as well. This is very significant because based on the findings of Birch (1998) children develop their food preferences very early in life making this a critical time to engage in activities that may increase their willingness to try healthy foods.

The second level of the ecological model relates to the family and home environment and how they influence a child's eating behaviors. Participants in this study also described how gardening programs affect several factors on this level. Children taking part in gardening programs were often able to share their experiences and increased knowledge with their families, which in some cases resulted in increased knowledge of parents as well as gardening at home or participation in community gardens.

Finally, the outer level of the ecological model displays various factors outside of the child's home that may have an influence on eating behaviors and fruit and vegetable consumption. The factors on this level that were influenced by gardening programs included accessibility of and exposure to fruits and vegetables. Many childcare providers felt that the increased exposure to the food grown in the gardens resulted in an increase in

willingness to try more fruits and vegetables and an overall increase in consumption of these foods. Some expressed that not all of the children in their care are exposed to a wide variety of fruits and vegetables on a regular basis and that the gardening activities in the childcare setting offered an effective way to do this.

Data collected in this study also shows non-nutrition related benefits to using gardening programs with young children. These benefits included an opportunity for children to connect with the natural environment, using the garden in other areas of the curriculum and as a sensory activity. Participants also found that the gardening activities were a source of enjoyment for the children and an activity they could fully engage in. In some cases, childcare providers even found their gardening programs to be beneficial from a marketing standpoint.

Fostering a connection with the natural environment was a benefit of gardening programs that many childcare providers found to be very important. This concept is consistent with other research that has shown children who are able to experience gardening in their daily life are more likely to feel more connected to their environment and are more likely to engage in behaviors that protect it (Strife and Downey, 2009). The importance of this concept with very young children, as many participants of this study expressed, is that the earlier in life a child begins having these experiences with the natural environment, the more they will carry the lessons they learn from them throughout their lives. This has been described in other research as environmental values that are shaped during childhood and carried into adulthood (Blair, 2009).

Using the garden in other areas of the curriculum was another benefit that was discussed by many of the childcare providers. Some participants felt that gardening programs were beneficial as an interdisciplinary tool, particularly in a childcare setting because there was more freedom in the curriculum than in later childhood education settings and many ways in which the garden could be applied to their learning. A major reason why childcare providers in this study felt that gardening was such an effective interdisciplinary tool was that it was an activity that the children thoroughly enjoyed and were able to engage in. The children were excited about using the garden throughout their day including mealtime, playtime, and lessons, which childcare providers felt aided in the learning process.

Some existing research has focused on the benefit of gardening and other nature-based curriculum used with preschool age children in science education and specifically, process learning (Hachey and Butler, 2009). Several of the participants in this study noted that process learning is important during the early stages of a child's development. Allowing them the experience of planting seeds, caring for them, and learning what they need to survive is an excellent, hands-on way to teach children in a process-oriented manner about the life cycle of plants and other living things. Other ways in which childcare providers were able to extend the gardening experience into other areas of the curriculum were with simple math lessons. Some participants described using beans that were picked from the garden by the children in a lesson on counting, while others graphed the height of their vegetable plants. By using the gardening activities in all areas of the curriculum, these programs gain additional benefits and relevance outside of their impact on nutrition and health.

A study conducted by Williams and Dixon (2013) investigated the influence of school gardening programs on academic performance across elementary, middle school, and high school students. They found that gardening activities had a positive influence on academic performance, knowledge, and attitudes across several subject areas including science, language arts, mathematics, writing, and social studies (Williams and Dixon, 2013). Other research focusing specifically on science education found similar results with an increase in academic achievement associated with participation in elementary school gardening programs (Smith and Motsenbocker, 2005). While these particular research studies focused on older children, the results from this study show that these benefits also occur with younger children.

Particularly important with the target age group in this study was sensory learning. Childcare providers felt that using gardening as a sensory activity was extremely effective. It was noted that children this age need the hands-on learning and many programs were able to use their garden as a means of allowing children to experience their senses. One program described using food from their garden in lessons about the senses such as cutting open a pumpkin and describing how it feels, smells and looks while others drew pictures of their vegetables. All providers using gardening programs offered the chance to taste the food from the garden in order for the children to experience that sense as well.

Finally, a benefit of gardening programs that was mentioned by several childcare providers was that offering this type of program at their facility was beneficial for them from a marketing standpoint. Participants who had a successful gardening program stated that they always highlighted that aspect of their curriculum to prospective families looking

for childcare. Other providers who were not currently gardening felt that the marketing aspect of it was a motivating factor in choosing to implement a gardening program. Highlighting the garden as not only a source of healthy food for children and, in some cases, their families, but also a very effective educational tool for young children was seen as an effective strategy for childcare providers in recruiting new families for enrollment.

Challenges, Barriers, and Resources Needed for a Successful Gardening Program

The challenges and barriers discussed by participants in this study were similar to those experienced in gardening programs with older children as documented in previous research studies. These included a need for funding for materials and maintenance, training and education, curriculum resources, and volunteer support (Dobbs, Relf, and McDaniel, 1998; Hazzard et al. 2011). Childcare providers also discussed a number of resources that would be helpful to them in addressing these barriers.

One of the major challenges faced by childcare providers in implementing their gardening programs was an overall lack of resources. Participants felt that a source of funding was necessary in order to obtain the materials for their gardening program to be successful. Some childcare providers were fortunate enough to have grants from community and government agencies, however others who took on the cost of the gardening programs themselves felt they would greatly benefit from an outside source of funding. Many participants expressed that the initial cost of starting a gardening program would be the biggest financial burden due to the cost of the materials to build the garden and the tools needed for maintenance. After the initial cost, however, many felt that the

garden would not be expensive or they could find a way to maintain their program cost effectively. These findings show that supplying childcare providers with a source of funding to offset the costs of implementing a gardening program would be beneficial.

Grant funding and other financial assistance for gardening programs is available from a variety of sources, however not all childcare providers in this study were aware of how to access it. According to a summary of grants and awards offered by the National Gardening Association (NGA), preschool or Head Start programs utilized only 8% of all grants provided by this organization. In addition to grants, the NGA included in their summary other sources of funds various gardening programs utilize. These included donations, school district funds, parent or volunteer organization funds, fundraisers, and instructor or childcare provider's personal funds (NGA, 2012). Increasing awareness and access to financial resources among childcare providers is crucial to increasing the success of gardening programs targeted at preschool age children. This could be done possibly through agencies such as Childcare Solutions that provide continuing education credits for licensed childcare providers or through government programs such as CACFP.

The participants who were recipients of grant funding to implement their gardening programs still felt they faced other challenges, however. Although they had the financial resources to purchase building materials, tools, and seeds or plants to start their gardens, they felt they lacked much of the knowledge and support they needed for a successful gardening program. Unless the childcare site had an employee who had previous knowledge of gardening practices, many providers felt they needed to seek out training and educational materials on their own. Several participants expressed that this was a major

barrier for them. These findings are consistent with those of Dobbs, Relf, and McDaniel (1998), who examined the needs of elementary school teachers in implementing gardening programs in the classroom. These researchers found that teachers felt that a source of gardening information in the form of a Master Gardener or educational materials with regular updates such as newsletters was critical to the success of a gardening program (Dobbs, Relf, and McDaniel, 1998).

Providing information, training, and educational materials for staff members could possibly aid childcare providers in overcoming other barriers and challenges to garden implementation. Such challenges include pest management, low yields, and weather concerns. The success of a childcare gardening program seemed to be dependent on whether or not there was an employee at the facility with previous gardening knowledge. Some of the more successful day care gardening programs had a staff member who was knowledgeable about topics including fertilization and natural pest deterrents such as inter-planting herbs in the garden. Providing other childcare centers with this knowledge and training may help them to be more successful regardless of the pre-existing gardening knowledge of their staff members. In a study of educators in school gardening programs, DeMarco, Relf, and McDaniel (2006) found that Master Gardeners were essential to the success of gardening programs for a number of reasons. In some cases, a Master Gardener from a Cooperative Extension program or other community group was able to provide information and guidance to teachers and other school staff in ways to manage a school garden, the learning theories involved, and how a garden can augment various areas of the curriculum allowing schools to make the most of their gardening activities. In other cases, Cooperative Extension programs were able to train the teachers or other staff members

themselves to be Master Gardeners in order to make the gardening program more successful and sustainable.

In the case of this study, participants overwhelmingly stated they would be willing and interested to participate in further training in order to increase the impact and success of their gardening programs. Opportunities to partner with local gardening groups, Master Gardeners, Cooperative Extension programs, or other community organizations could provide an avenue of effective training to help these childcare providers to overcome many of the barriers they have experienced and have a more successful gardening program.

Another major resource that participants expressed a need for was curriculum materials. Although there are a number of gardening curricula in existence for use with preschool age children including Early Sprouts (earllysprouts.org) and the USDA's "Grow It, Try It, Like It" program (USDA FNS, 2010), it was apparent that many childcare providers were unaware of them. Both of these programs are available for childcare providers and educators with the aim of increasing exposure to and knowledge of fruits and vegetables and healthy eating. They also emphasize parent and family involvement with recipes and other activities for the children to do at home. Curricula such as these encompass many of the aspects participants of this study were concerned with including planning and organization of the activities, how to carry out the activities and be successful in doing so, and parent involvement. Utilizing these materials as well as other similar programs would be extremely beneficial in helping childcare providers to succeed in their gardening program implementation and address many of the challenges they currently face.

Finally, childcare providers in this study described volunteers and community support as resources that would be helpful in implementing a successful gardening program. Many expressed that parents were often willing to volunteer, however that was not the case for all programs. Previous research on successful community gardens describes partnerships between gardening programs and the communities as an effective means of gaining resources (Twiss et al., 2003). This could include local gardening groups or other volunteer organizations. In the case of childcare centers that do not have staff present on the weekends or occasionally during the summer, reliance on volunteers to handle maintenance such as watering and weeding would be particularly important. Partnering with local residents or neighborhood associations to take on some of this responsibility would also be an avenue to consider in order to maintain the daycare gardens.

Strengths, Limitations and Implications for Future Research

There were a number of strengths in this research study including the method of data collection and the inclusion of a variety of childcare settings. Using a structured interview format to collect qualitative data allowed for participants to answer the same questions as one another, but also elaborate on each topic in order to uncover new themes. Incorporating various childcare settings in this study including daycare centers, family daycare providers and group family daycare providers allowed researchers to compare and contrast the factors affecting garden implementation in each type of setting. While many of

the benefits and barriers were similar among the various settings, there were some that were unique to each type of facility.

There were several limitations in conducting this research study including the relatively small sample size and selection of participants. Recruitment of a large sample size proved to be difficult as there was very little response to initial recruitment methods. Due to the low response rate from the e-mail solicitation, recruitment of participants was mainly reliant on the solicitation letter and follow-up phone calls. However, inaccurate contact information provided for several potential participants also limited the recruitment of a larger sample. Although the sample size of 20 participants offered sufficient data to achieve the research objectives in this study and common themes were found throughout the interviews, increasing the sample size may have offered additional information regarding the benefits and barriers of gardening with young children. Secondly, a larger sample size may have offered more diversity among participants. Among the sample population, although there was a sufficient amount of geographic diversity, there was little ethnic diversity with the majority of the participants being Caucasian (n=19). Additionally, socioeconomic data was not collected and may have been beneficial in determining factors influencing the benefits and barriers of gardening programs. Finally, participants whom agreed to take part in this study proved to be enthusiastic about gardening programs with young children. Although not all childcare providers were currently implementing gardening activities, most had plans to do so in the future. The lack of childcare providers in the sample population that had little or no interest in implementing a gardening program may have affected the results of this study by leaving out further barriers to these types of activities.

Opportunities for future research in the area of gardening programs with young children include quantitative studies in order to prove the legitimacy of these programs. Like those examining the benefits of gardening with elementary, middle and high school students, measuring both nutrition-related parameters as well as social and academic data among children between the ages of two and five years old would be helpful in quantifying the value of these programs. Additionally, there is a need for outcome evaluation measures among existing gardening programs. In order for childcare providers to be successful in their gardening programs, it is important for them to learn from the challenges of others. Particularly among those programs awarded funding through grants, it would be beneficial to determine where the money was spent and how it could be more effectively distributed in the future.

Conclusion

While a wealth of research currently exists on the benefits of gardening with school-age children, very little exists among preschool-age children. This study was able to achieve the research objective originally set in determining the motivation of childcare providers to implement instructional gardens for use with children between the ages of two and five years old. In doing so, benefits, barriers, and potential strategies for overcoming those barriers were uncovered, which will be beneficial for future childcare providers desiring to implement a gardening program. While this study set out with a focus on nutrition related benefits of gardening, particularly increasing fruit and vegetable consumption, a variety of additional non-nutrition related benefits were discovered. These findings serve as an

extension of the existing literature in that the benefits of using instructional gardens as both a means of increasing the health of children and as an interdisciplinary educational tool can be applied to preschool age children as well as older children.

Increasing community support, access to and awareness of funding, training, and curriculum resources are all necessary in order to ensure the success of current and future gardening programs in the childcare setting.

Appendix A

Structured Interview Questions

Location:

Childcare Provider Name:

Date/Time of Interview:

Demographic Questions:

1. What is your role here at the childcare center?
2. How many children are cared for here on a daily basis?
3. What is the age range?
4. How many care providers are employed at this site?

F/V Consumption

How important do you feel fruit and vegetable consumption is for yourself?

How important do you feel fruit and vegetable consumption is for children?

What do you feel are some of the benefits of fruit and vegetable consumption for children?

Do you have any previous coursework or training in nutrition?

Do you feel that the children in your care are consuming the recommended amount of fruits and vegetables on a daily basis while at your child care operation?

Do you feel that the children are willing to try the fruits and vegetables that you serve them?

What are some examples of the types of fruits and vegetables you serve?

Where do you get the fruits and vegetables you serve? For example, are you responsible for doing the shopping and if so, where do you buy them. If not, do you have a produce vendor?

Do you feel that the mealtime environment you provide in your childcare setting has an impact on the eating behaviors of the children? Mealtime environment includes all of the factors involved during a meal such as timing, location, food served, and eating behaviors of each individual participating in the meal.

What role do you feel you play in the child's eating behaviors?

Do you feel that the home environment influences the eating behavior of the children you care for?

Gardening

Do you currently use any gardening activities that would involve growing fruits or vegetables?

Do you use any formal gardening curriculum?

What do you feel are some of the benefits to having a garden in a childcare setting?

What are some of the factors that might prevent you from having a garden?

Do you have the space to implement a garden at your location?

Do you have the time necessary to implement and maintain a garden?

Do you have the tools, such as shovels, rakes, stakes, wire fencing, etc. to implement a garden or do you feel you would have access to these supplies?

Do you think the children you care for would enjoy a gardening experience while at daycare?

Do you feel the parents of the children would be in favor of a gardening program?

Would you be willing to participate in gardening training?

What resources do you feel would be helpful in implementing more gardening activities here?

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Education

- C.A.S. Syracuse University Dietetic Intern
- M.S. Syracuse University
Nutrition Science and Dietetics
- B.A. Syracuse University
Biology

Experience

- Community Nutrition volunteer experience with the Food Bank of Central New York and Meals on Wheels of Syracuse Sept 2010-Nov 2012
- Clinical Nutrition volunteer experience with Crouse Hospital and Upstate University Hospital Feb 2012-Jan 2013
- Nutrition Education experience with O.R.A.N.G.E. W.R.A.P. volunteer outreach group of Syracuse University and Lion's Camp Hickory Youth Camp for children with Type 1 diabetes Aug 2011-July 2012
- Contributing writer for *Fleet Feet Sports* Nutrition Blog June 2012- Present

Publications/Presentations

- New York State Dietetic Association May 1, 2013

Research Experience

- Determining the Motivation of Childcare Providers to Implement Instructional Gardens as a Means of Increasing Fruit and Vegetable Consumption Among Children Ages 2 through 5 June 2013

Teaching Experience

- Teaching Assistant for Dr. Sarah Short, Syracuse University August 2011-May 2013
 - Nutrition in Health, Nutrition for Fitness and Sport

Affiliations/Memberships

- Member of the American Academy of Nutrition and Dietetics August 2011-Present
- Member of the New York State Dietetic Association August 2011-Present