

**MITIGATING CHILDHOOD FOOD INSECURITY THROUGH
GARDENING**

An Undergraduate Research Scholars Thesis

by

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Submitted to the Undergraduate Research Scholars program at
Texas A&M University
in partial fulfillment of the requirements for the designation as an

UNDERGRADUATE RESEARCH SCHOLAR

Approved by Research Advisor:

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May 2020

Major: Biomedical Sciences

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ABSTRACT

Mitigating Childhood Food Insecurity Through Gardening

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Despite the prosperous image of the United States, many households are affected by the continuum of food insecurity and this problem is presented even more in Brazos County, Texas. Food insecurity is more than being in a state of hunger. It is the inability to acquire adequate nourishment. USDA defines food insecurity as “limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.” In other words, not knowing when and where the next meal is coming from, or how one will pay for it. Children in food-insecure households are even greatly impacted by this crisis and this can hinder their growth or impede them from succeeding academically. They are at risk of facing a more drastic mental and physical consequences of food insecurity as well as suffering from social and mental problems. Most of the time, the inability to obtain nutritious food arises from money conflicts and time issues. Being on an unhealthy and cheap high caloric diet is an easier alternative than spending time and money to consume healthier foods. In this ethnographic research study, a group of students at the Brazos County Boys and Girls club was taught how to grow their own sustainable gardens in the hopes of helping mitigate the impacts of

food insecurity they face. The survey interviews from parents revealed their desire to obtain more nutritious food for their household and interest in installing gardens in their own homes.

DEDICATION

I would like to thank my principle investigator, Dr. Sarah N. Gatson and Christa Cardenas for their mentorship, guidance, and support over the course of this project, they provided me with the tools to succeed and helped make this project a wonderful experience.

I would also like to extend my gratitude to my research team who have dedicated so much of their time to me and being invaluable, thank you.

ACKNOWLEDGMENTS

I would like to thank all the members of Dr. Gatson's Everybody Eats project for their immense support and hard-work on aspects of this project, from the start of the project to the Garden Club at the Boys and Girls club, none of it could be possible without them. Thank you to my team members, Christa Cardenas, Camila Savinon, Grace Lu, and Hannah Horcha.

I would also like to thank Andrew McNeely and others for their help and support through the Aggie Research Scholars Program. This program has immensely helped move the project forward.

CHAPTER I

INTRODUCTION

Food insecurity is built in opposition to the concept of food security, which was defined during the 1996 World Food Summit as “food security exists when all people have physical and economic access to sufficient safe and nutritious food at all times to meet their nutritional needs and food preferences to lead an active and healthy life” (Food and Agriculture Organization [FAO], 1996). Therefore, access to acceptable, sufficient and adequate food, which depends on income and the cost of food, is restricted for large sectors of the population that suffer from food insecurity. Food insecurity in Texas presents a panorama of great contrasts. Although the supply of food energy available in Texas exceeds the requirements to meet the demand, the strong deficiencies in access give rise to a heterogeneous panorama of great deficiencies that require targeted interventions in certain population groups and certain regions. The poor access to good nutritional food of important groups, adds chronic child malnutrition still to attend, as well as the high prevalence of overweight and obesity in children, adolescents, and adults. The double burden of malnutrition prevents adequate physical and intellectual development of the individual while increasing the risk of chronic noncommunicable diseases, with large direct and indirect costs for families and society.

The objective of this research was to introduce gardening to children facing food insecurity to mitigate the negative impacts of food insecurity in their households. Through previous studies, childhood food insecurity is seen to have drastic impacts on the health of growing children (Cook et. al, 2004). In addition to past research, gardening is a method utilized to teach children the importance of eating healthy and developing key qualities in them (Blair,

2009). From past research, it is yet to be fully understood how gardening can mitigate childhood food insecurity in communities in the Brazos Valley. Based on the fact of impacts of gardening, this research is anticipating that teaching children how to garden will give them the knowledge to grow their own sustainable gardens at home and help alleviate the impacts of food insecurity they face at home. Through this research, an outcome that can hopefully be achieved is the finding that teaching children how to garden will moderate the negative effects of being in a food-insecure household and overall attempt to break the endless cycle of food insecurity some children are born into.

Literature Review

For many, the concept of hunger brings in the cliché image of children in faraway places with stick like legs and bloated bellies. Perhaps when the idea of hunger in community arises, the image is a homeless man standing at the end of the ramp with a cardboard sign. Previous studies show the truth is that one in six adults are actively hungry in our community, or food insecure, simply meaning they don't know how or when they will get their next meal. These statistics are more alarming for the situations involving children because, with children, one out of four children are either actively hungry or food insecure right here in our own backyard (Wight & Thampi, 2010). Hunger is a significant and critical issue in the society today, right here in the bountiful United States and specifically the Brazos Valley. In the Brazos Valley, one out of every five adults is food insecure while more than one-third of the children living in this community face food insecurity (Dean & Sharkey, 2011). Whether it is vividly apparent or not, hunger surrounds our society every day.

Past research has found that the largest and fastest-growing demographic of hunger in communities is working families such as auto mechanics, clerks, etc (Olson, 1999). Many of the

households that are food insecure are ordinary people who work hard every day but live on an income that just won't stretch from paycheck to paycheck. When faced with the difficulty of living in a food-insecure household, people are confronted with making difficult tradeoffs such as between food and medical care, food and utilities, food and transportation, and food and housing. A majority of the individuals decide to cut back on good nutritious food to pay for other essential needs of daily living. When families cut back on eating healthy, the whole family, especially children, are presented with a higher probability of getting ill, such as having high blood pressure, diabetes, and poor health overall (Cook et al., 2004). The lack of access to nutritious food causes health problems like obesity and diabetes. Hungry children can't concentrate in school, which results in higher dropout rates which results in them returning to the endless cycle of being part of a food-insecure household.

Studies suggested that a strong link exists between negative health risks and childhood food insecurity. Strong association persists between childhood food insecurity mental health issues, physical health issues, cognitive developmental delays, and negatively influences academic abilities. In 2013, the USDA Economic Information Bulletin that researches food insecurity in households with children revealed health impairments associated with food insecurity face by children. Children in food-insecure households had greater rates of depressive disorders and suicidal symptoms when compared to adolescents in food-secure households. There exists a higher level of anxiety and depression among school-age children residing in food-insecure households than those in food-secure households. These children also tend to have internalized behavior problems, such as social withdrawal and anxiety, than children from food-secure households.

The Economic Information Bulletin also revealed physical health problems associated with childhood food insecurity. Iron deficiency anemia, frequent headaches, and more colds, higher hospitalization rates, and a higher number of chronic health conditions were seen in children in food-insecure households than in children residing in food-secure households. Aside from physical and mental health implications associated with food insecurity, children from food-insecure households had a 168% higher likelihood of showing forms of misconduct than those in food-secure households (Jackson & Vaughn, 2017).

Food insecurity has been associated with negative academic abilities in children. Children who face childhood food insecurity have lower math achievement and lower math progress than those who do not face this issue (Coleman-Jensen, McFall, & Nord, 2013). They have lower arithmetic scores and have a higher likelihood of repeating a grade. Proper nutrition has been shown to promote academic performance and food insecurity which is associated with improper nutrition has also been shown to create poor academic performances.

Furthermore, children who live with families that battle with food security are likely aware and concerned about food security, too. In 2011, the Journal of Nutrition published a study that studied families at risk for food security and it stated that the children detected when the household had a reduced amount of food and when caregivers acted differently at mealtimes to conserve food resources. Children were also seen to take responsibility for handling food resources by reducing food consumption, requesting other people for sustenance, and seeking income for food (Fram et al., 2011).

Studies evaluating school gardening were analyzed for the service-learning/ethnographic portion of this research. In 2012, the Journal of Hunger & Environmental Nutrition published an article that examined the impact of elementary school gardens and the consumption of vegetables

at school lunch. This article was reviewed to see if a gardening program would have a positive impact on children choosing to consume more vegetables. The study found that “offering garden produce at school lunch had a small positive impact on children’s food choices” (Cotugna et al., 2012). Research has shown how teaching students how to garden encourages them to eat healthily and have a balanced diet (Carney et al., 2012). Gardening has also been shown to affect the brains of children as seen through their higher scores in science achievements. Through the process of gardening, students can question the science behind gardening as well as use minor math concepts (Hachey & Butler, 2009). Gardening provides students as a way to be physically active. Gardening with family and friends has shown to improve moods and decrease the anxiety of children. Teamwork skills are learned and practiced through group gardening. The children obtain a sense of responsibility and purpose through gardening and have better learning experiences. Overall, gardening not only serves as a tool to help mitigate food insecurity but also serves as a powerful tool for children’s personal growth (Marsh, 1998).

Project Description

This research is part of an ongoing longitudinal ethnographic project initiated in 2013. The thesis author and team members, under the guidance of Dr. Sarah N. Gatson, have been engaged in participant observation with the Positive Sprouts garden club at the Boys and Girls Club of the Brazos Valley since October 2017. The gardening lesson plans are part of Texas A&M AgriLife Extension Program’s Learn, Grow, Eat & Go! curriculum. Other gardening lesson plans from the scholarly literature are also used.

The lesson plans are created to be presented to the students at the Brazos Valley Boys and Girls Club for one day every week. The afterschool program is known as Garden Club/ Positive Sprouts Club for the children. The children are observed, and field notes are taken. Parents are

informed of the research project and asked if they are willing to install raised bed gardens in their households as part of the project. All the interactions, answers to questions, and field notes are evaluated at the end to see if there was a significant effect on the eating habits and development of students involved in this project. Building from these research experiences, the thesis will be focused on using the field notes to analyze the impact gardening has on students and the project's interview protocol with the parents/guardians of the garden club members. Garden club members takes the lead on designing and installing starter food gardens with their households. The objective for this research was to aid in facilitating the Brazos Valley to become a community where everyone has access to healthy, nutritious food, anytime they need it. The focus of this particular research project, a part of the Everybody Eats project (TAMU IRB #2013-0764D), was to educate children at the Brazos Valley Boys and Girls Club on how to garden and grow healthy and nutritious food for themselves. They will learn how to grow their own small gardens at their homes and act as peer community educators in order to mitigate food insecurity in their own households.

CHAPTER II

METHODS

This is an ethnographic study that is the service-learning portion of the research at the Boys & Girls Clubs of Brazos Valley (BGC) located at 900 W Wm J Bryan Pkwy, Bryan, TX 77803. The location was chosen due to previous networking with the BGC in the past and the location provided available space for the desired activities. Visits to BGC were made once a week with a research team of less than five undergrads and a team leader. Each visit was approximately an hour and a half. The programs and activities were created as a group to educate youth in home gardening techniques with a program called “Positive Sprouts/Garden Club”. All BGC members were invited to participate in the program; however, in order to stay in the program, the students were required to have a signed IRB-approved parental consent and child assent form on file. All parental consent and child assent forms are stored in a locked filing cabinet in faculty advisor’s office, located on Texas A&M University campus.

Throughout the semesters that Garden Club was active, children from kindergarten to high school have participated. The ethnicity of the participants were White, Hispanic and Black/African-American. The research team provided hands-on edible gardening experiences utilizing as many organic gardening practices as possible for children to learn how to grow their own food. The team also promoted organic gardening practices to teach participants how to conserve resources. Derived from numerous literature review that the research team conducted, youth development practices were employed to encourage positive youth development among the participants.

The lesson plans were created by the research team by looking at different articles exploring gardening practices to help encourage kids to eat healthy. Each lesson plan for the week involved a food component, where the students learned about a new snack that the team created for the participants, a gardening activity component, and a take home component. The lesson plans were created in order to engage students from kindergarten to high school. Outcomes and details of the lesson plans were recorded on the field notes.

Healthy snacks were provided every week that the research team went to BGC. The snacks were provided as a means to teach Garden Club participants about healthy alternatives to bad caloric snacks that they are used to. Easy to make snacks were given to participants in order to teach them about being self-sufficient and making their own food or food for family. Products from the gardens grown at the BGC were even sometimes used by participants to make food such as cilantro dip.

Different gardening activities were talked about and practiced each week. Students learned how to grow various plants during different seasons and got the hands-on experience on how to start a simply raised bed garden. Keyhole gardens were built by the research team and the participants of the Garden Club in order to help alleviate the time needed to take care of the plants. A compost area was created for the students to cultivate and produce usable compost for the gardens they were taking care of. Garden club members were in charge of what they planted and how they wanted to manage the resources.

The take-home component of the Garden Club included, seeds for gardening, worksheets to complete at home or share with others, arts and crafts the participants made, and/or recipe lists to make healthy snacks at home. This component of the Garden Club was crucial to get the participants' household involved in the concept of gardening and reaping benefits from it. Some

of the participants at the Garden Club come from food insecure households; therefore, introducing gardening to these households can be beneficial.

Field notes drive was created in order to record weekly activities and detailed progression of the project. Pictures were obtained to show reactions of participants to wards different gardening projects that were done weekly. Team members report observational field notes within 24 hours of BGC activity and reported interpersonal social interactions between participants, participants and observers. Team members took special interest in conversations about food, nutrition, home life, and gardening in order to seek to identify any trends or similarities with the literature review.

The IRB research does have an approved interview or survey regarding household food security or nutrition for the parents of the participants. This survey can be utilized to see how Garden Club has had an effect in the household of the participants. The parents and the participants also had the option of installing a free raised bed garden in their household. The research team would have provided all the materials.

CHAPTER III

RESULTS

An important factor for a successful youth development program is providing physical and psychological safety (Tough, 2016). An advantage for “Garden Club” is we have access to a locked, fenced, relatively quiet area for gardening activities. This physically secure area provides the participants with a physical barrier from non-participants. Field notes have shown that the members of the Garden Club had a safe environment to explore their interest in gardening because they are the one who mainly maintained the garden by themselves. The research team merely provided the supplies that were requested.



Figure 1. Garden Club Participant getting ready to plant seeds.

It was recognized that the participants were curious and exploratory. Participants often asked questions towards the research team members and were eager to get their hands dirty and work as seen in Figure 1. There were times when conflict has occurred between the students,

fighting for who gets to do a specific task. The research team intervened and resolved the conflict in a calm and appropriate manner. The students learned about conflict resolutions that day. Healthy conflict resolution tactics such as speaking one at a time, summarizing the other parties' statements, and solution finding are highly encouraged in the Garden Club. The concept of respect was encouraged in order to build a sense of community in "Garden Club" and respect for nature. These practices have allowed the research team to develop closer bonds with the participants which indicates a sense of psychological safety.



Figure 2. Garden Club participants (in red shirts) try cilantro from keyhole garden.

Children thrive when they feel secure and the research team provides appropriate structure such as regular timeline of events. Participants grow their own fruits and vegetables and

feel a sense of accomplishment when they can finally taste the fruits of their labor as seen in Figure 2. Healthy and specific snacks were given to show the participants new ways to eat foods that they can grow at home. For example, during the fall 2019, the students were provided apple pears in order to teach them about GMO foods. Snack provides the research team an opportunity to give instructions on the activities and a chance to reinforce rules. After snack time, the participants are divided into teams to accomplish our necessary tasks. For example, during the reconstruction of keyhole gardens one team was assigned to gather materials, one team to layer materials, and one team to care for the plants as seen in Figure 3. Participants are given reminders throughout the visit about instructions and rules and cleanup responsibility is shared among all participants. The participants are frequently provided with home projects that begin as seed starting with the goal of the participants growing the plants at home as seen in Figure 4. The team incorporates elements of positive youth development in our program at the Boys & Girls Club of the Brazos Valley and our participants are actively involved in learning how to grow their own food.



Figure 3. Garden Club members adding soil to keyhole garden.



Figure 4. Midget Melon seeds in a pot are taken home by Garden Club members.

The participants would often request for us to bring in foods to try that they have not seen before. Once we bought in dragon fruit and star fruit for the students to try. They were mesmerized by the shape and color of the fruits and really wanted to plant the seeds for the fruits in the garden. That day we taught them that there are different regions where a plant is ideal to grown and dragon fruits are most commonly grown in Asia and rare to grow in North America. The students were adamant to grow the dragon fruit in their keyhole garden and kept the seeds. Unfortunately, it did not grow but it was a learning experience for the students. They realized that every plant is unique, and each had its own conditions that needs to be met in order for growth to occur.

Overall, the Garden Club participants and the research team members had a positive outcome from the research projects. The field notes show that the participants were always excited to do the activities that were designed by the research team. They students would share how they used the skills learned at the Garden Club to grow their own plants at some of their homes. The parents were also enjoying the take home activities as well. The activities allowed the parents to engage with the children and learn about gardening in some way or form.

Over the years that Garden Club has been present, there has been a handful of students who consistently have been active participants. They were talking to the other Garden Club members how some of their parents have gardens at home and what type of plants they grew. These students were able to teach new students some of the basic gardening technique and took on a leadership role for the new students due to their familiarity with the club and their background. There were some students who talked about how they started eating the daily recommended servings of fruits and vegetables whenever they can after the research team had the lesson plan on the food pyramid. The Garden Club activities increased motivation in some students to strive for a healthier lifestyle and grow their own garden at home.

CHAPTER IV

DISCUSSION

Adequate nutrition contributes fundamentally to the realization of the right to the enjoyment of the highest attainable standard of physical and mental health for boys and girls. The adverse physical health, mental health, and mental links with childhood food insecurity are vast. The research team showed that teaching children how to garden can mitigate the effects of childhood food insecurity that they face in their households and encourage them to have a healthier lifestyle. The service-learning research has demonstrated that the participants are more willing to participate in garden-based activities and are more willing to eat foods they grow. The participants are also enthusiastic to take home plants to grow for share with their families.

The objective of this project was accomplished. The research team was able to introduce gardening to children in food insecure households in order to mitigate the negative impacts of food insecurity. From the Garden Club, the children were able to take home seeds, pots, soil, and other materials to start their own small garden. Children in Garden Club became more motivated to try new healthy foods, once they saw how it is made and produced. Gardening has brought students of different backgrounds together to accomplish a common goal. It has taught many different skills such as teamwork, cooperation, leadership, communication, and many more as seen through the field notes in the results.

Despite the increased number of participants at the Garden Club each year, survey for parents were not able to be completed. Parents of the participants often have a busy schedule and come to pick up students after the research team leaves the site. Those who agreed to be contacted via phone interview were not available at the time. Request for more interviews were

not able to be made due to the unforeseen events surrounding the COVID-19 virus in spring 2020, complete data was unavailable at the time of publication for this URS thesis. Therefore, the data that was analyzed in this thesis had to come from the detailed field notes of the research team members over the past years. The field notes were analyzed with the literature review to analyze the outcome of the Garden Club program on the participants.

Future Goals

For future evaluation of Garden Club, surveys should be implemented for both children and parents and the results should be analyzed to observe how much impact the lesson plans created by the research team has been. Surveys could be made that the parents and children have easy access to, so they have time to complete it. Another way to move this project forward is to teaching others, not just the students in Garden Club, to garden. Having a club similar to Garden Club in high schools or other afterschool community programs can help different groups of people facing the issue of food insecurity. Lastly Garden Club lesson plans can be modified to be implemented in different groups of people who are interested in gardening to grow their own sustainable food.

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