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To the Graduate Council:

I am submitting herewith a thesis written by Marissa Black entitled "Youth Can! Grow their Community: Qualitative Evaluation of a Gardening-Enhanced Positive Youth Development Program." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Nutrition.

Marsha Spence, Major Professor

We have read this thesis and recommend its acceptance:

Sarah Colby, Katie Kavanagh

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(Original signatures are on file with official student records.)

**Youth Can! Grow their Community: Qualitative Evaluation of a Gardening-Enhanced
Positive Youth Development Program**

A Thesis Presented for the
Master of Science
Degree
The University of Tennessee, Knoxville

Marissa Janay Black
August 2019

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ABSTRACT

Background: Rates of obesity and overweight for children and adolescents have remained above objectives and disproportionately affect minority youth. Diet quality is one factor related to overweight and obesity and is suboptimal for American youth. Nutrition education programs with additional components including gardening have targeted factors related to diet quality such as increasing fruit and vegetable intake and youth development strategies have been used to empower youth to make healthy changes. This study, in which participants engaged in a nutrition education and gardening program with a focus on improving the health of their community, evaluated the participants' perceived ability to participate in research, level of intent to be involved in improving the health of their community, and perceived understanding of nutrition concepts as a result of participating in the program.

Methods: Participants attended two hour-long weekly lessons for a total of eight weeks at a predominantly minority community youth center. The lessons pertained to nutrition with gardening elements, all while empowering youth and training them to design their own research. The program was evaluated using in-depth interviews with participants. The interviews were coded by two research assistants and analyzed using content analysis.

Results: A total of 11 youth participated in the interviews. The interview results suggest that most participants expressed increased self-efficacy to help their community. Participants were able to describe barriers to healthy eating and provide potential solutions to these barriers, and some reported positive changes in their diet and nutrition knowledge. Although the participants designed a research project on their own, they did not seem to recognize the research experience gained from participating in the program.

Discussion: The results of this program suggest that youth can gain self-efficacy to improve the health of their community as a result of participating in a gardening-enhanced nutrition education program with youth development strategies. However, participants did not appear to gain self-efficacy to engage in research. Further, participants provided useful feedback which can be used to strengthen the design of similar programs.

TABLE OF CONTENTS

Chapter 1: Literature Review	1
Introduction	1
Youth Nutrition Interventions	2
Multicomponent Nutrition Education Interventions	2
Gardening Interventions	5
Youth Development Strategies	9
Positive Youth Development	10
Youth Participatory Action Research	16
Conclusion	21
Theoretical Framework	23
Research Goals & Program Objectives	23
Chapter 2: Manuscript	26
Introduction	26
Project Description	27
Methods	27
Research Design	27
Program Recruitment	28
Program Implementation	28
YPAR Project Development	30
Data Collection	31
Analytic Strategy	35
Results	37
Qualitative Results	39
Community Content Analysis	39
Healthy Eating/Nutrition Content Analysis	41
Research Content Analysis	41
Additional Findings	44
Discussion	46
Limitations	48
Conclusion	49
Chapter 3: Expanded Methodology	50
Project Overview	50
Participant Recruitment	50
Incentives	51
YCGC Lessons	52
Fidelity Checklist	54
Evaluation Tool	54
Data Collection	55
Qualitative Data Analysis	56
References	59
Appendices	71
Appendix A. Informed Consent	72

Appendix B. Assent Form.....	75
Appendix C. Fidelity Checklist.....	76
Appendix D. Demographic Survey.....	81
Appendix E. Interview Guide.....	83
Appendix F. Recruitment Materials.....	86
Appendix G. YCGC Logo	87
Vita.....	88

LIST OF FIGURES

Figure 1. Cycle of Youth Empowerment. Adapted from Curtis K. Empowering Youth: How to Encourage Young Leaders to do Great Things. Minneapolis, MN: Search Institute Press; 2008:5.	12
Figure 2. The Social Cognitive Theory Model. Adapted from Bandura A. Social Foundations of Thought and Action Englewood Cliffs. NJ: Prentice-Hall, Inc.; 1986.	24
Figure 3. Power Ladder Illustration	32
Figure 4. Action Plan Illustration.....	32
Figure 5. Participant Flowsheet	34
Figure 6. Flowsheet of Coding Process	36
Figure 7. Map of Community Content Analysis with Representative Quotes	40
Figure 8. Map of Healthy Eating/Nutrition Content Analysis with Representative Quotes	42
Figure 9. Map of Research Content Analysis with Representative Quotes.....	43
Figure 10. Map of Participant Feedback Content Analysis with Representative Quotes.	45

CHAPTER 1: LITERATURE REVIEW

Introduction

Rates of obesity for American youth have tripled since the 1970s, reaching 18.4% and 20.6 % for children ages 6-11 years and 12-19 years in 2016, respectively.^{1,2} These rates are above the Healthy People 2020 objectives of 15.7% for youth ages 6-11 years and 16.1% for those 12-19 years old.³ Including the percentage of youth with overweight status, dramatically increases the numbers of youth above a healthy weight. Recent data from the 2016-2017 National Survey of Children's Health show that 31.0% of youth ages 10-17 years are overweight or obese nationwide.⁴ Further, the results of this survey place Tennessee as the state with the second highest rate of overweight and obesity in this age group, at 37.7%.

Breaking down these statistics by race, this issue disproportionately affects minority youth. The rate of overweight and obesity in Tennessee youth increases from 30.8% for White non-Hispanic youth to 44.2% for Hispanic youth and 54.4% for African American youth.⁴ These statistics are a major concern because research shows that overweight and obese youth are more likely to be overweight or obese in adulthood than their peers who were healthy weight during childhood.⁵ Overweight and obese youth are at an increased risk for developing conditions during childhood such as high blood pressure, insulin resistance, and fatty liver disease.⁶ Additionally, they are at risk for a host of diet-related diseases in adulthood including coronary heart disease, type 2 diabetes, and certain cancers.⁷

The U.S. Department of Agriculture (USDA) relates poor dietary quality to the rise in childhood obesity.⁸ An analysis of National Health and Nutrition Examination Survey data by the USDA found that adolescent diets fell short of dietary recommendations, and could improve with additional vegetable, whole grain, and seafood consumption, and decreased consumption of solid fats and added sugars.⁸ Several studies suggest that healthy dietary patterns formed during childhood may continue into adulthood.^{9,10} Therefore, it is especially important to target dietary patterns during these formative stages in life.

This paper explores the potential for programs that focus on multicomponent nutrition education and gardening interventions, along with positive youth development, and youth participatory action research to improve diet quality by influencing self-efficacy, nutrition knowledge, and health-related behaviors in youth.

Youth Nutrition Interventions

Multicomponent Nutrition Education Interventions

School-based nutrition education programs have emerged as tools to improve the nutrition of children, thereby combatting obesity and other preventable diet-related diseases. However, a 2013 position paper by the Academy of Nutrition and Dietetics (AND) found that the evidence supporting programs that focus solely on nutrition education to influence diet-related behaviors was insufficient.¹¹ Since then, many recent nutrition education programs have adopted additional components such as physical activity, cooking, and gardening to assist in influencing diet-related knowledge and behaviors in youth. One such multicomponent program was the year-long Shaping

Healthy Choices Program (SHCP) conducted by Scherr and colleagues in 2017.¹² The researchers assessed outcomes such as BMI Z-score, dietary patterns, and nutrition knowledge in fourth graders from four randomly-selected intervention (n=230) and control (n=179) schools in California. The intervention schools received nutrition education lessons, cooking demonstrations, health fairs, and educational newsletters to share with their families. In addition, these schools had gardens and salad bars installed and wellness committees available to students. The objectives were measured using pre- and post-tests that assessed nutrition knowledge using a previously validated questionnaire¹³ updated to adhere to MyPlate recommendations,¹⁴ dietary patterns using the Block Food Frequency Questionnaire,¹⁵ vegetable identification and preferences using an assessment previously used in the Nutrition to Grow On study,¹³ and anthropometric data. ANOVA tests revealed that nutrition knowledge (mean change=2.2, p<.001) and vegetable identification (mean change=1.8, p<.001) improved in the intervention group compared to the control group.¹² Additionally, SHCP participants had significantly decreased BMI Z-scores (mean change=-.28, p<.001). However, there was no significant changes in the intake of fruits and vegetables, the only dietary patterns assessed. Therefore, although SHCP may have increased knowledge and improved BMI scores for youth, it did not appear to improve an important aspect of diet quality based on self-reported data.

The Michigan Model for Health¹⁶ is a nationally recognized education curriculum with health education activities from the kindergarten to high school level and was evaluated at the middle school level in a 2008 quasi-experimental pilot study by Fahlman and others.¹⁷ The study used pre/post-assessments with 20 questions added to a

previously validated survey.¹⁸ The additional questions were developed, reviewed by a panel of experts and middle school teachers, and pilot tested on middle school students.¹⁷ Researchers used repeated analysis of variance to analyze the effect of the intervention on nutrition knowledge, behaviors, and efficacy. Intervention participants had significant improvements in fruit ($F=3.97$, $p=.47$) and vegetable ($F=5.61$, $p=.02$) consumption and nutrition knowledge ($F=72.82$, $p<.001$) compared to the control group.

The Michigan Model for Health was evaluated for use with elementary school students in a 2010 longitudinal study by O'Neill and colleagues.¹⁹ The researchers randomized 52 schools into intervention and control groups and investigated the effects of the curriculum on health issues for the population of 2,512 fourth and fifth grade students over the course of two years. Using self-reported pre- and post-tests comprised of previously validated scales and items,²⁰⁻²³ the researchers assessed the intervention's effect on health-promoting skills, aggressive and prosocial behavior, and drug use behavior and intention.¹⁹ The results of mixed model analysis indicated that the intervention significantly impacted social and emotional health ($F=4.67$, $p<.001$) and interpersonal skills ($F=4.76$, $p<.001$). Additionally, the intervention significantly affected intention to smoke cigarettes ($F=4.02$, $p<.001$) and drink alcohol ($F=3.04$, $p<.01$).

More recently in 2016 O'Neill and colleagues²⁴ investigated the effect of the Michigan Model for Health on fitness and safety in 52 elementary schools using a previously validated assessment¹⁸ administered to intervention and control group before and after the intervention.²⁴ Results of mixed model analyses showed that the intervention group had significantly higher fruit consumption ($F=3.55$, $p=.003$) and

improved safety skills ($F=3.73$, $p=.05$) and safety attitudes ($F=2.66$, $p=.02$). However, the intervention did not affect the consumption of other items including vegetables.

Gardening Interventions

School gardening interventions have become increasingly popular during recent years. A meta-analysis by Langellotto and Gupta in 2012 found that garden-based interventions may be more successful at increasing vegetable consumption in school-aged children than traditional nutrition education programs.²⁵ They attributed the success of garden programs to their ability to increase access to vegetables and make children less reluctant to try new foods. Several studies have assessed the effect of gardening interventions on fruit and vegetable intake and related attitudes and behaviors.²⁶⁻²⁹ A cluster-randomized controlled trial in England conducted by Christian and colleagues found that gardening programs with high levels of implementation were associated with higher fruit and vegetable intake in children.²⁶ Levels of implementation were defined by the researchers using a scale based on the school's involvement in gardening in terms of development, education, and community interaction. This study was conducted in 23 schools with a total of 641 participants. The intervention groups received The Royal Horticultural Society (RHS) Campaign for School Gardening, consisting of a teacher-led and RHS-led intervention. Both intervention groups received assistance on developing a garden program. Gardening level, a measure assessed by the RHS based on the development, teaching, and community involvement of a program, was determined at baseline and again at follow-up using a questionnaire based on measurements developed by the RHS. The study assessed diet quality using the previously validated CADET food

diary questionnaire.³⁰ Multilevel regression models were performed to assess the changes in fruit and vegetable intake between RHS-led and teacher-led intervention groups.²⁶ Analyses found that increasing three levels of gardening implementation increased fruit and vegetable intake by an average of 81 grams ($p=.05$). The findings of this study suggest that intensive gardening programs may have a positive influence on fruit and vegetable consumption. Christian and colleagues suggest that combining additional interventions may increase the engagement and therefore improve the fruit and vegetable intake in children.

A study by Ratcliffe and others was conducted using a quasi-experimental pre- and post-test design to assess youth's knowledge, attitudes, and behaviors related to vegetable consumption after a gardening intervention.²⁷ The study followed 170 middle school-age youth in two ethnically diverse intervention schools and one control group of 150 youth. The intervention group participated in 13 hours of lessons focused on health, science, and gardening, as well as hands-on gardening activities. Youth participated in community events by preparing lettuce for the student body and participating in a garden work party. The control group received only science and health-focused lessons. The investigators hypothesized that a garden-based education could improve willingness to try, preference for, and consumption of vegetables in middle-school children. Vegetable-related knowledge, attitudes, and behaviors were assessed using a Garden Vegetable Frequency Questionnaire (GVFQ) and a Taste Test survey adapted from previous studies.^{31, 32} The GVFQ was determined to be a reliable tool by comparing the tool to the 24-hour recall prior to the study.²⁷ Students in the same age range were randomly assigned to complete one or the other, and both tools returned the same average vegetable

consumption. The Taste Test assessed youth's ability to identify, taste, and rate five vegetables. Independent t-tests were performed to assess changes in the dependent variables between intervention and control cohorts. The results of the GVFQ survey and Taste Test revealed significant improvements in vegetable preference (intervention $\bar{x}=7\pm3$, control $\bar{x}=-.2\pm3$; $p=.03$) and identification (intervention $\bar{x}=.6\pm1.4$, control $\bar{x}=-.03\pm1.2$; $p=.002$) respectively for the intervention group compared to the control group. The variety of the vegetables consumed at home, however, did not vary between the two cohorts. The researchers suggested that future studies may need to incorporate home and community components to their design to improve consumption at home.

Results for a multi-component gardening intervention were more positive compared to gardening studies with only one component. The Sprouting Healthy Kids (SHK) program focused on fruit and vegetable consumption based on levels of exposure to gardening.²⁸ This study assessed 246 participants from ethnically diverse, low income middle schools using one school as a control. Students were given freedom to join any of six interventions, including in-class lessons, taste-testing, and an after-school gardening program. Students self-reported exposure level to each component on the SHK Questionnaire, which was pilot-tested bilingually. A Fruit and Vegetable Food Frequency Questionnaire, which has been previously tested and found to have good test-retest reliability³³ was used to assess fruit and vegetable intake, and linear regression analyses were performed for each variable. Results indicated minimal gardening exposure increased knowledge (intervention $\bar{x}=3.59$, control $\bar{x}=3.38$; $p=.02$) while exposure to two or more intervention components increased self-efficacy (intervention $\bar{x}=20.3$, control $\bar{x}=17.33$; $p=.01$), decreased preference for unhealthy food (intervention $\bar{x}=7.63$,

control $\bar{x}=8.11$; $p=.01$), increased knowledge (intervention $\bar{x}=4.00$, control $\bar{x}=3.30$; $p=.01$) and fruit and vegetable intake (intervention $\bar{x}=4.29$, control $\bar{x}=3.06$; $p=.01$).²⁸ No individual component was found to significantly affect fruit and vegetable behavior. This study suggests that a multiple-component approach should be applied to garden-based programs for effective results on fruit and vegetable consumption and related knowledge and behaviors.

Duncan and colleagues assessed the effect of a 12-week gardening program at a British primary school.²⁹ Using the Theory of Planned Behavior (TPB) as a framework, the study sought to predict the relationship between attitudes, subjective norms, perceived behavioral control, and behavior changes. The study followed 46 students at an intervention school who were involved in gardening activities and related curriculum. Students were assessed using validated tools, including a questionnaire³⁴ to measure the TPB constructs of intention, attitude, norms, and perceived behavioral control. The previously validated Day in the Life Questionnaire (DILQ)³⁵ was used to assess fruit and vegetable consumption. A separate control school with 31 students was assessed using the same methods.²⁹ All students were assessed pre- and post-intervention. Analysis of variance (ANOVA) was conducted to assess changes in fruit and vegetable consumption and TPB constructs pre- and post-, as well as between the two groups. Results showed an increase in fruit and vegetable consumption for the intervention group (mean change=1.4 portions/day, $p<.01$) but not the control group. Similarly, changes were seen in the constructs of the TPB for the intervention group, but not the control group. To assess the relationship between TPB constructs and changes in intention, hierarchical linear regression was performed. The findings revealed that changes in the constructs of TPB

predicted 17% of the variance ($p=.05$) of fruit and vegetable consumption. Subjective norms were found to significantly predict fruit and vegetable intake ($p=.03$). However, the changes in TPB constructs did not predict changes in intention relating to fruit and vegetable consumption. Researchers concluded that gardening interventions could improve fruit and vegetable intake in primary school children. Furthermore, subjective norms could predict these changes in fruit and vegetable consumption.

Research from Amsterdam assessed the gardening-related perceptions of youth.³⁶ Nury and colleagues conducted a qualitative study of a year-long school gardening program in two primary schools. Researchers gained insight into the youth's reception of the program using participatory observation and 22 semi-structured interviews. Transcriptions of the observational field notes and interviews were analyzed using content analysis. A majority of these youth reported enjoyment of the program. Others described improvements in skills. Some youth developed a sense of accomplishment from growing their own food, which they felt could improve vegetable consumption. However, youth expressed a desire for increased autonomy and involvement in the experimental design.

Youth Development Strategies

Youth development strategies such as positive youth development (PYD) and youth participatory action research (YPAR) have the potential to improve diet quality by encouraging self-efficacy and motivating change. Youth-led Participatory Action Research (YPAR) is an approach that trains youth to conduct their own research³⁷

whereas PYD is an approach which aims to involve youth in prosocial behaviors to build positive relationships, enhance their skills, and develop positive outcomes.³⁸

Positive Youth Development

Despite research supporting its ability to improve factors related to health,³⁹⁻⁴² PYD has not been widely used in nutrition interventions. Traditionally, PYD research has focused on the prevention of undesirable behavior in at-risk youth, including substance abuse and teenage pregnancy.³⁸ Promising research has emerged that suggests PYD may be useful for purposes other than preventing risky behaviors. Studies have shown that PYD may be a successful strategy for improving health-related behaviors such as fruit and vegetable intake^{39, 40} and physical activity^{41,42} in youth.

The PYD approach focuses on a range of youth development strategies that build on the strengths of youth to promote positive change.⁴³ Successful programs in the field of PYD are guided by the development of several constructs, which include promotion of social competence, development of self-efficacy, promotion of cognitive competence, and recognition of positive behavior.⁴³ The 5 C's model of PYD asserts that youth gain competence, confidence, connection, character, and caring as a result of participating in a PYD program.⁴⁴ Competence is described as building self-efficacy to develop skills such as teamwork and conflict resolution. Confidence focuses on fostering self-efficacy and self-worth. Connection relates to the relationships youth build with each other as well as adults such as community leaders and family. Character emphasizes a sense of respect for

others and for prosocial norms and values. Finally, caring refers to the ability to empathize with others.⁴⁴

The cycle of empowerment, illustrated in Figure 1, is an important component to youth development. Empowerment theory asserts that people feel valued by the community if the environment fosters the idea that youth are important.⁴⁵ This sense of importance makes youth feel safe and encourages them to contribute to their community.⁴⁵ Youth empowerment values the process over the final product of a program. Regardless of the results of a youth development program, the emphasis is placed on building relationships with youth and empowering them to learn through solving problems on their own. The relationships developed between youth and adults are central to the empowerment process.⁴⁵ Effective listening is key to building relationships in these partnerships.⁴⁵ Youth must be given the opportunity to lead and taught the skills necessary to succeed.

A study by Gutuskey and colleagues in 2016 that was guided by empowerment theory described the experiences of participants of a youth-led healthy eating and physical activity team at an elementary school.⁴¹ The researchers collected qualitative data from nine students participating in a health improvement team who were tasked with making the school environment healthier. A total of 19 interviews were conducted with the participants and co-instructors to identify their perceptions of participating in the team. Four observations were made at team events and meetings by non-participants to provide further detail on the impact of the experience. Results of the interviews and observations were analyzed using a grounded theory approach. The interviews revealed that students perceived an increase in leadership skills such as self-confidence as a result

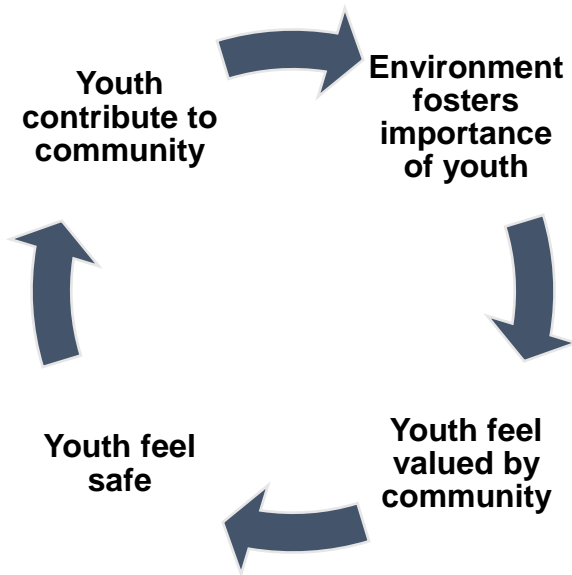


Figure 1. Cycle of Youth Empowerment. Adapted from Curtis K. Empowering Youth: How to Encourage Young Leaders to do Great Things. Minneapolis, MN: Search Institute Press; 2008:5.

of their participation. Students also described changes in health-related behaviors. Several students felt they developed healthy eating habits, and others noted an increase in their physical activity. Researchers concluded that overall perceptions of the experience were positive.

The study *Hand in Hand Serves the Community* assessed the results of a participatory youth leadership training program for secondary schoolchildren in Hong Kong.⁴⁶ A total of 180 students were randomized, with 50 students participating in the intervention and 130 students serving as the control group. The intervention was designed to improve self-esteem and self-efficacy through leadership training and 20 hours of volunteer services. Self-efficacy was measured pre- and post-intervention using the Chinese version of the General Self Efficacy Scale Questionnaire. This 10-item scale was found to be valid and reliable in a study of 74 Chinese adults with symptoms of anxiety and depression.⁴⁷ Categorical variables of the study were assessed using chi-square tests, and t-tests were performed for continuous variables.⁴⁶ The statistical analyses found that overall scores for self-esteem and self-efficacy did not significantly increase in the intervention group or the control groups. Stratifying by gender revealed that female participants in the intervention group compared to the control group had significantly improved self-esteem (intervention $\bar{x}=+2.38$, control $\bar{x}=-.24$; $p<.001$) and self-efficacy (intervention $\bar{x}=+1.32$, control $\bar{x}=-.04$; $p=.043$) values.

Another study in Hong Kong revealed more promising results related to self-efficacy.⁴² Ho and colleagues evaluated the effect of a sports-based PYD program in 12 secondary schools on physical and mental well-being and physical fitness measures. Investigators randomly assigned 692 students evenly to either an intervention group

which received sports mentoring sessions, or a control group which received a web-based health education game. The intervention aimed to build a youth-centered environment focusing on the empowerment of youth. Students selected which sports to learn and communicated with mentors to develop a learning path. The mentors were coaches trained in PYD principles. Physical and mental well-being were assessed using a validated 12-item questionnaire known as the SF-12v2.⁴⁸ Developmental assets were measured using the General Self-Efficacy Scale.⁴⁹ All outcome measures were assessed at baseline and one month post-intervention.⁴² Independent 2-sample *t* tests were performed to assess differences between groups at baseline and post-intervention. Results indicate that measures did not significantly differ at baseline. Post-intervention analysis found that the intervention group experienced significantly greater mental well-being (intervention $\bar{x}=48.43\pm 8.33$, control $\bar{x}=46.15\pm 9.59$; $p=.001$), self-efficacy (intervention $\bar{x}=29.69\pm 4.92$, control $\bar{x}=28.45\pm 6.21$; $p=.01$), and resilience (intervention $\bar{x}=68.37\pm 13.15$, control $\bar{x}=65.43\pm 17.76$; $p=.02$). The intervention improved mental health and development assets in a low-risk population.

A mixed-methods PYD study by Woodgate and others investigated the effects of a cardiovascular health promotion program led by middle school students in Canada.⁵⁰ Guided by the 5 C's model of PYD, the study explored the ability for youth to promote cardiovascular health when provided with education, empowerment, and support. The intervention lasted two years. Youth were trained on leadership, team-building skills, and cardiovascular health. Youth were then tasked with identifying, initiating, leading, and monitoring health promotion activities. A total of 26 youth participated in three focus groups before, during, and after the intervention. Themes and categories related to the

youth's capacity for health promotion were derived from the focus groups using the constant comparative method of data analysis. Themes that were revealed from the focus groups included 'doing the right thing' and 'wanting to make a change, but feeling constrained'. The theme of 'doing the right thing' encompassed the personal responsibility to make healthy lifestyle choices instead of engaging in unhealthy behaviors. Barriers to making positive changes were identified in the theme of 'wanting to make a change, but feeling constrained.' Participants documented their experiences following intervention activities using journals. The themes 'I get it' and 'the project has changed me!' emerged from the journals recorded by the youth. Youth were enthusiastic about participating in research and perceived an increase in their ability to promote health. The quantitative evaluation was completed by 20 students using the previously validated PYD.2 questionnaire⁵¹⁻⁵³ pre- and post-intervention. This questionnaire was designed to evaluate the promotion of positive youth development based on the 5 C's model. Researchers used paired *t* tests to assess changes in the five constructs from pre- to post-intervention.⁵⁰ The quantitative evaluation did not reveal significant changes in any of the five constructs, potentially due to the small sample size. Researchers surmised that the length of the program may have decreased the motivation of the participants, which could explain the lack of change seen in the PYD constructs. The relatively high initial scores on the PYD.2 questionnaire could also factor into the insignificant quantitative results. Over 17% of the youth possessed all five constructs based on the pre-intervention assessment. Despite the lack of significant changes in PYD.2 scores, results from the qualitative assessments suggest youth responded favorably to the intervention and increased their capacity for health promotion.

Preliminary data from the Fresh Producers program in California suggest that youth-run produce distribution may improve professional development in secondary schoolchildren.⁴⁰ This program involved students in the marketing, distribution, and sale of produce to members of the community. The population was composed of Fresh Producers participants from a charter school, a continuation school, and a traditional high school. Researchers conducted 13 semi-structured focus groups with 72 students to evaluate the feasibility, impact, and challenges of the program. Themes and subthemes were identified from the focus group data, and the results were coded using thematic analysis. Key themes included community engagement, professional skills, and produce consumption. Participants from the charter school and traditional school described an increase in their fruit and vegetable intake as well as their nutrition knowledge. This theme was less prominent in the continuation high school. Students from all three schools reportedly developed professional skills as a result of the program. A lack of support from faculty was identified as a challenge of the program. Overall, researchers concluded that the program was well-received by participants. However, since the program was evaluated at three low-income, urban high schools the results may not be generalizable to other age groups or income levels.

Youth Participatory Action Research

The revolutionary approach of YPAR has been shown to promote leadership⁵⁴ and motivate youth to make changes in their communities.⁵⁵ Limited research has investigated the ability for YPAR programs to encourage health-related changes in youth. A study by Reich and colleagues described a project that involved middle school youth in

a participatory research project.⁵⁶ Fourteen youth collaborated with university researchers over the course of a semester to identify a problem area related to the school environment, evaluate the problem, and disseminate their research. Youth decided to focus on the school lunch quality as the topic of their research. Throughout the duration of the project, youth received information from the research team on the National School Lunch Program, survey-writing, and analyzing and presenting data. The youth were involved in creating surveys to assess students' preferences for different food items at the cafeteria. Surveys were modified based on findings from cognitive interviews conducted between youth and the research team. The youth collected surveys from 435 students, representing 44% of the student population. They disseminated their findings and discussed potential solutions with school administrators and district food personnel. District personnel requested a copy of the youth's presentation and survey data. This descriptive study did not evaluate the youth's perceived changes as a result of their involvement in participatory research. However, the project resulted in a new line of communication between youth and district food personnel. The researchers identified the administration's commitment to improving the school environment as an important component of the project.

A YPAR study by Chou and others described the perspectives of youth who dropped out of school or attended alternative education.⁵⁷ A research team (consisting of six youth co-researchers, co-facilitators, faculty supervisors, and a principal investigator) met weekly to develop research strategies. Youth co-researchers (who were students in a high school-level alternative education program) received training on research methodology. The youth co-researchers recruited 18 participants between the ages of 15

and 19 years, who had either dropped out of school (n=1) or who were attending alternative education (n=17) to participate in the study. The researchers used the Enhanced Critical Incident Technique (ECIT) method to structure the design of the study. The ECIT research method draws from the Critical Incident Technique (CIT), which is a flexible outline of procedures to collect behavioral data and to explore what helps and what hinders an activity.^{58, 59} The CIT method has been used extensively as an investigative tool in qualitative research.⁶⁰ It involves determining the goals of an activity, planning and specifying the actions, collecting and analyzing data, and interpreting and reporting the results.⁵⁸ The ECIT incorporates several enhancements into the CIT method, including credibility checks and wish list items to provide information on elements participants would like to have received.⁵⁹ The youth conducted semi-structured interviews to identify helpful, hindering, and wish-list incidents related to the educational experiences of participants.⁵⁷ Data were analyzed using thematic analysis, and the nine credibility checks of the ECIT were performed to validate the results. The results of the analysis were used to provide recommendations to improve high school completion rates, which youth disseminated to the school district and other venues. Youth reflected on their experiences as co-researchers during dialogues with members of the research team. Some youth felt more engaged with school as a result of the project, while others reflected on the leadership skills they developed. Collaborating with youth provided a unique perspective and allowed them to be directly involved in school reform. Overall, the authors concluded that the study validated the youth as stakeholders and fostered self-efficacy.

A study by Ozer and Wright assessed the ability of a YPAR program to increase youth's influence over school policies in two public high schools.⁶¹ The schools consisted of a mid-sized, predominately Latino high school among the lowest-achieving schools in a district and a large, predominately Asian and European American high school with the highest achievement in the same district. Researchers evaluated a program designed to provide leadership development during an elective class in the fourth year of a five-year research study. Youth at one school chose teaching practices as their topic of interest, while the other focused on attracting underrepresented applicants to increase diversity at the school. Youth from both schools conducted surveys and interviews to evaluate effective strategies and presented their findings to faculty. To assess the opportunities for student involvement in school policies and practices as a result of the project, semi-structured interviews were conducted with faculty and staff. Students' perceptions of the impact of the project were elicited through focus groups. Content from the interviews and focus groups were transcribed, coded, and analyzed deductively and inductively. Themes that emerged based on reflections from students and teachers included professionalism and seriousness as well as novel interactions between youth and adults as the youth transitioned into their roles as researchers. Underrepresented students felt the experience provided an opportunity to be heard. The authors concluded that the YPAR program provided opportunities for youth development and fostered student power.

A quasi-experimental pilot study of the Youth Can! program evaluated the effects of using a PYD framework to train youth to engage in school-based interventions.⁶² The study compared youth from two intervention schools who received nutrition and physical activity education and were involved in the planning, implementation, and development

of school nutrition-related policies with three control schools where youth received only nutrition education lessons. A total of 100 fourth and fifth-grade youth completed a pre- and post-intervention 24-hour dietary recall and survey. The survey assessed items based on the social cognitive theory constructs of environment, attitude, and behavior. Youth in one intervention school consumed an additional half-serving of fruit ($p < .001$), while youth in the second school consumed 3.9% less fat ($p < .05$) than the control schools.

The Youth Can! curriculum has been further evaluated as reference material for a youth gardening and development of a pilot program.⁶³ This study found that the team-building components of the Youth Can! were effective at engaging youth. Additionally, youth were more engaged when they were involved in creative activities, “missions” to find information, and experiential activities like gardening compared to didactic experiences involving lectures or handouts.

Limited research has assessed the convergence of YPAR and gardening interventions. YPAR offers a potential approach to engage youth and provide autonomy in gardening programs. The Garden Mosaics pilot program provided an example of a gardening program that engaged youth in the research process.⁶⁴ Youth from seven different sites in six diverse U.S. cities were involved in participatory research activities with the goal of taking action on research related to the planting practices of the predominately ethnic-minority gardeners. A total of 85 youth ages 9 to 16 years participated in a summer program with 26 community gardeners and 31 trained educators. The youth at all sites interviewed gardeners and conducted soil tests for analysis.⁶⁵ Youth from five sites worked to identify problems in the garden and presented their findings to the community. The researchers evaluated the outcome goals by

conducting in-depth interviews and focus groups with the educators and youth at the beginning, middle, and end of the program.⁶⁴ Preliminary data from this pilot study revealed that youth were successful at conducting interviews and enjoyed being autonomous.⁶⁵ Twenty youth reported an increase in gardening skills, fourteen developed positive relationships with the adults, and twelve reported an increase in research skills.⁶⁴ Youth reflected on improvements in knowledge, responsibility, and gardening enjoyment. However, educators expressed difficulty engaging youth in the participatory research activities. The youth had little involvement with the overall design of the program and objectives. Additional research is needed to assess youth's involvement in these stages of participatory action research related to gardening.

Conclusion

While multicomponent nutrition education interventions have the potential to improve nutrition knowledge^{12, 17} body mass index¹², and diet-related behaviors (such as fruit and vegetable intake), the level of effect is variable.^{17,24} Gardening programs show promise for improving fruit and vegetable consumption in youth^{26,28,29} by providing access to fruits and vegetables and familiarizing youth with fruits and vegetables to which they may not have been exposed.²⁵ Several of the gardening interventions reviewed appeared to have benefited from high levels of youth engagement.^{28, 26} Qualitative research is scarce in nutrition and gardening education programs, making it difficult to decipher what aspects of these programs motivated youth to achieve these outcomes. One qualitative intervention found that youth enjoyed improving skills but desired an opportunity to make autonomous decisions.⁶⁴ Based on this study, engaging

youth in the design of a gardening intervention could prove successful at improving the quality of their diet.

Youth development strategies such as PYD and YPAR have been employed to empower youth, providing them with autonomy and engaging them in the research process. While PYD strategies have traditionally been reserved for decreasing risky behavior in youth, several recent studies have shown that PYD programs may be effective at strengthening youth's capacity for promoting health,⁵⁰ increase nutrition knowledge,⁴⁰ and improve healthy eating patterns.^{40,41} The benefits of youth development strategies are far-reaching. Interventions that involved youth in designing research found that YPAR had the potential to engage children in school,⁵⁷ expand communication lines between youth and adult figures,⁵⁶ and foster leadership skills.⁵⁷ Research also shows that PYD programs are capable of improving self-confidence,⁴¹ self-efficacy,^{42, 41} and community engagement⁴⁰ in youth.

In summary, research has shown that programs that focus on nutrition education and gardening could improve diet quality by improving fruit and vegetable intake and nutrition knowledge. Incorporating youth development strategies such as YPAR and PYD could further build leadership skills and self-efficacy in youth, empowering them to engage in health-promoting activities in their community. However, there is a lack of studies that combine nutrition education and gardening with youth development approaches. This research project addressed this gap by exploring the convergence of nutrition education, gardening, and the youth development approaches of YPAR and PYD.

Theoretical Framework

This research project was guided by the framework of the Social Cognitive Theory (SCT). The SCT focuses on the origins of thought and the influence of thought processes on behaviors.⁶⁶ In this model, behavior, cognition, and the environment interact to shape human nature (Figure 2).⁶⁶ This theory can be used to explain factors related to youth's dietary behaviors and decision-making.⁶⁷ The SCT emphasizes the importance of self-efficacy on shaping one's future.⁶⁶ Self-efficacy is the perceived ability to perform a task, rather than the actual skill level.⁶⁶ Studies have shown that perceived self-efficacy can influence motivation and performance.^{66, 68} People tend to avoid activities they do not perceive themselves capable of performing, and instead focus on areas where they are confident in their ability to succeed. Based on the SCT, youth's nutrition knowledge and skills, self-efficacy, and interactions with their environment are all factors that can influence dietary patterns.

Research Goals & Program Objectives

The goal of this study was to evaluate a program, Youth Can! Grow in Communities (YCGC), which combined nutrition and gardening education with PYD and YPAR strategies to improve youth's perceived ability to engage in research, understand basic nutrition concepts, and intent to engage in their community. The YCGC program aimed to increase participants':

1. Perceived ability to engage in research.
2. Understanding of nutrition concepts.

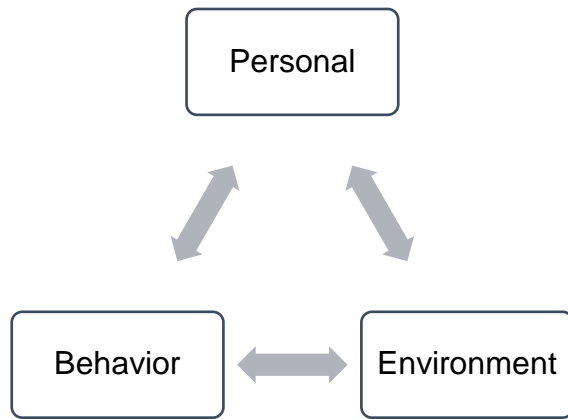


Figure 2. The Social Cognitive Theory Model. Adapted from Bandura A. Social Foundations of Thought and Action Englewood Cliffs. NJ: Prentice-Hall, Inc.; 1986.

3. Intent to be engaged in improving nutrition- and other health-related factors in their communities.

CHAPTER 2: MANUSCRIPT

Introduction

Childhood obesity remains a serious public health concern that disproportionately affects minority youth⁴ and increases the risk of becoming overweight or obese in adulthood.⁵ Data from the 2016-2017 National Survey of Children's Health show that childhood obesity rates are particularly high in the Southeastern United States.⁴ Tennessee had the one of the highest rates of overweight and obesity (37.7%) in youth ages 10-17 years, second only to Mississippi (39.2%), and over 5% higher than the national average of 31% for this age group.⁴ While the cause of the high rates of obesity and overweight in American youth is multifaceted, the US Department of Agriculture (USDA) asserts that diet quality may play an important role.⁸ An analysis of children and adolescents' adherence to the dietary guidelines based on the USDA's Healthy Eating Index found that their overall diet quality was low and did not meet 50% of the recommended intake of vegetables and whole grains.⁶⁹

A variety of strategies have been employed to improve the diet quality of youth, including nutrition education programs with gardening programs.^{25-29, 36} Nutrition education programs that include gardening components have been shown to increase youths' nutrition knowledge and intake of fruits and vegetables.^{26,28,29} Combined with youth development strategies, programs with nutrition education and gardening components may have the ability to empower youth to make positive health-related changes in their community. Although positive youth development (PYD) and youth participatory action research (YPAR) have not been extensively used to examine

nutrition-related outcomes, a few studies have shown that youth who were involved in health-related PYD programs developed healthy eating habits⁴¹ such as increased fruit and vegetable intake⁴⁰, while youth who participated in a program that combined elements of PYD with YPAR increased their fruit consumption.⁶² Additional studies that engaged youth in PYD strategies found that youth had improvements in self efficacy⁴⁶, self-confidence and leadership skills,⁴¹ and community engagement.⁴⁰ Engaging youth in research in the process of YPAR could further improve leadership skills and engagement⁵³ to empower youth to make healthful changes for themselves and their community.

Project Description

This study evaluated a PYD/YPAR program that incorporated nutrition lessons and gardening components to provide youth with the skills and knowledge necessary to design their own research project. This manuscript explores the youth's perceived ability to participate in research, intent to be engaged with improving nutrition- and other health-related aspects of their community, and knowledge about nutrition after participating in a summer gardening-enhanced nutrition education program that combined youth development strategies of PYD and YPAR. This project received approval from the University of Tennessee Institutional Review Board, IRB Number UTK IRB-18-04450-XP.

Methods

Research Design

This qualitative research study was guided by the theoretical framework of the Social Cognitive Theory. A qualitative design was selected to allow for rich data to be

collected on the perceptions and intentions of youth after participating in the program. According to Creswell, a narrative approach should be used to capture the detailed experience of an individual.⁷⁰ Thus, a narrative approach was selected to provide a detailed understanding of the experiences of the youth during the program. The program's impact on youth's perceptions were evaluated using in-depth interviews with participants.

Program Recruitment

The program took place at a Young Women's Christian Association (YWCA) community center. Participants were recruited from the center's Summer Kids in Play (SKIP) program. Due to the structure of the community center, in which youth signed up for programs based on different age groups, convenience sampling was used for this study. Students ages of 9 to 14 years, an age group assigned to the program by the community center, were encouraged to sign up for the program, entitled Youth Can! Grow their Communities (YCGC). SKIP policies allowed for a maximum of 25 participants in each program. Inclusion criteria for participating in in-depth interviews to evaluate the program included the ability to communicate in English, enrollment in SKIP, parental consent (Appendix A), and youth assent (Appendix B). Exclusion criteria included failure to attend at least 50% of the 15 lessons during the summer program.

Program Implementation

Participants met for one-hour periods twice weekly for a duration of eight weeks. Lessons were led by the principal investigator. Youth received lessons on gardening and nutrition using PYD/YPAR strategies. The curriculum was designed to engage youth in

participatory action research. It combined lesson materials from three curricula: Youth Can!,⁶³ Growing Profits,⁷¹ and the Michigan Model for Health.¹⁶

The Youth Can! curriculum⁶³ was used to structure the first five units of the curriculum. Lessons from Youth Can! were divided into the units “Team Building”, “Taking Pride”, “My Healthy Body”, “Research for Change”, and “Communicating with my Community”. The “Team Building” unit was designed to help youth develop skills to work in a team and empower youth to make a positive difference. The “Taking Pride” unit aimed to improve self-worth and help youth understand the importance of locally grown food and what makes a community healthy. The unit “My Healthy Body” was designed to show youth how healthy food is related to a healthy body. Youth learned skills to help them use data, create research questions, and collect and analyze data in the “Research for Change” unit. The “Communicating with my Community” unit was designed to help youth build communication skills. The “Participatory Action” unit was added by the research team to facilitate youth’s development of an action plan for a project they selected to use the produce from their facility’s garden.

Growing Profits is a gardening project created by Purdue Extension.⁷¹ It contains 18 activities designed with an experiential learning focus. The experiential learning model encourages youth to “learn by doing”.⁷¹ Youth engaged in activities that provided them with opportunities to learn how to design a research project by involving them in the process. Activities from Growing Profits incorporated learning objectives related to competency, coping, and contributing. Growing Profits teaches youth about planting, harvesting, and selling produce from their garden over the course of the lessons.

The Michigan Model for Health is a nationally recognized education curriculum with health education activities from kindergarten to high school levels.¹⁶ This model targets positive behavior changes in youth to improve their health. The Michigan Model for Health has been shown to increase physical activity and improve nutrition knowledge among elementary school children.²⁴ A module intended for youth in grades 7 and 8 was selected for the nutrition education portion of the program.

Incorporating lessons from these three sources, the curriculum engaged youth in activities related to team-building, healthy eating, gardening, and community involvement. Weekly lesson content was checked using the Fidelity Checklist (Appendix C); the principal investigator who led the lessons documented the level of engagement of the youth and any deviations from the lesson plans.

YPAR Project Development

Upon completion of Unit 4, the program moved into the final two units, in which participants used their training on research, gardening, and nutrition to design a research project. The participants of YCGC were tasked with designing a project to use produce from their facility's garden. The project they independently designed involved using the produce to cook healthy meals for their community. The participants created an action plan for their project based on the Power Ladder a concept which was introduced from the Youth Can! curriculum. The youth built the ladder by plotting different community leaders they would need to collaborate with to ensure the success of their project on different rungs of the ladder in chronological order from bottom to top. An illustration of the Power Ladder outlining the participants' research project is shown in Figure 3

(below). It shows different entities, agencies, and individuals participants thought would be important to consult with about their project. They used the Power Ladder to develop an action plan (Figure 4).

Throughout the course of the YCGC program, youth had the opportunity to interact with local community leaders. As a part of the weekly lessons, youth identified local leaders who could help provide feedback on their plan and sent invitations for the leaders to attend an hour-long panel discussion during the sixth week of the program. Panel attendees included local farmers and farmer's market liaisons as well as health department employees, a nutrition researcher, and a fire chief. During the discussion, youth asked questions about the leaders' role in promoting health in the community and received advice on their project implementation. The program culminated in the youth presenting their action plan (Figure 4) to their peers, family members, and the director of the YWCA during the week following the final YCGC lesson.

Data Collection

Perceived changes as a result of the program were evaluated using in-depth interviews. Prior to the interview process, youth received a consent form (Appendix A) and an optional demographic survey (Appendix D) to be completed by their parents or guardians and an assent form (Appendix B) to be signed by youth participants. The principal investigator encouraged the youth to bring these forms home to discuss with their parents prior to agreeing to participate in the interviews. Only youth who had signed the assent form and who had a consent form signed by their parent or guardian were eligible to participate in the interviews. Interviewers asked participants who did not have

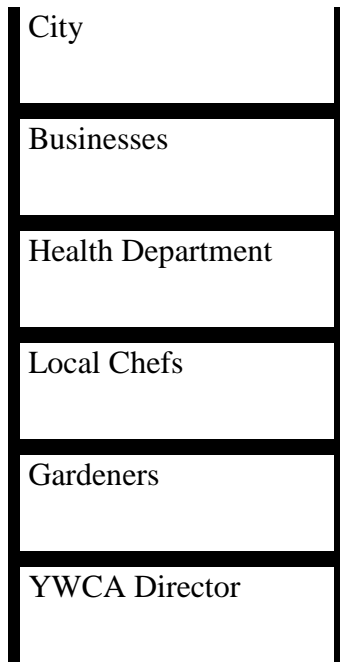


Figure 3. Power Ladder Illustration

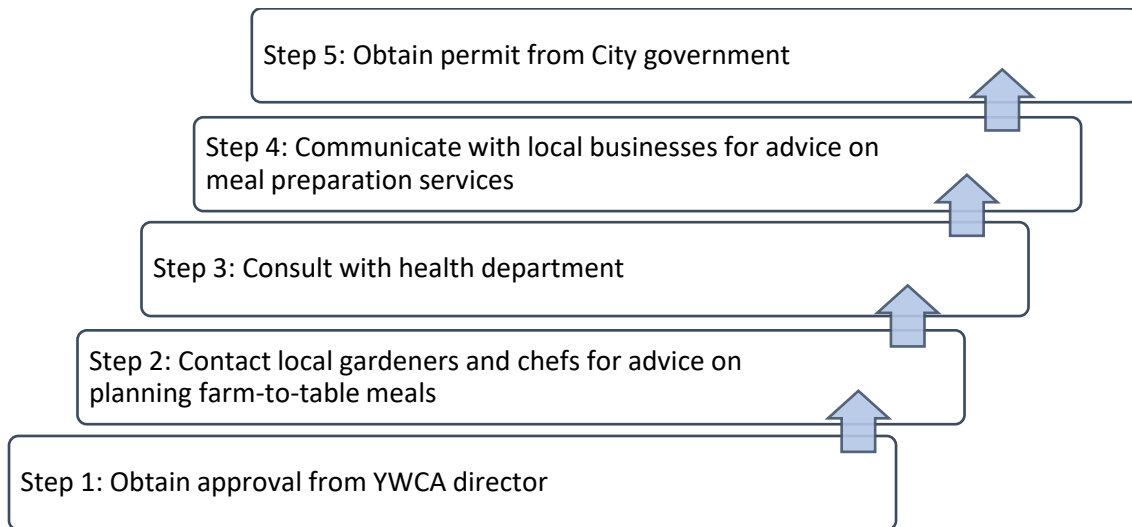


Figure 4. Action Plan Illustration

completed demographic surveys for their age, gender, and race prior to the start of the interview. Semi-structured, in-depth interviews were conducted individually with participants upon completion of the program. This format was selected because in-depth interviews can provide detailed information on behavior changes over time.⁷² An interview guide (Appendix E) developed by the research team and based on the study aims, was used to provide more structure than an informal conversational interview and offer more flexibility than a standardized open-ended interview.⁷³ Simple, open-ended questions were used to structure the interviews and to encourage conversation.⁷² The goal of the interview process was to have youth describe their perceived self-efficacy to engage in research, perceived understanding of basic nutrition concepts, and intent to be active in the community in the future. A sub-set of questions were used to assess youth's enjoyment of the program and suggestions for improvement. Probes were included in the interview guide to allow interviewers to prompt participants to elaborate on responses that seemed vague or unclear.

Three research assistants conducted the in-depth interviews. Due to the nature of the SKIP program, youth could leave prior to the end of the program, and several left the program prior to the time the interviews were conducted. All youth who met eligibility criteria, including having signed consent and assent forms were interviewed, as outlined in the participant flowsheet in Figure 5. The interviewers received training in social and behavioral research and met with the principal investigator to review the interview guide and prompts prior to conducting interviews. To avoid social desirability bias, the principal investigator who led the YCGC lessons did not conduct any interviews.

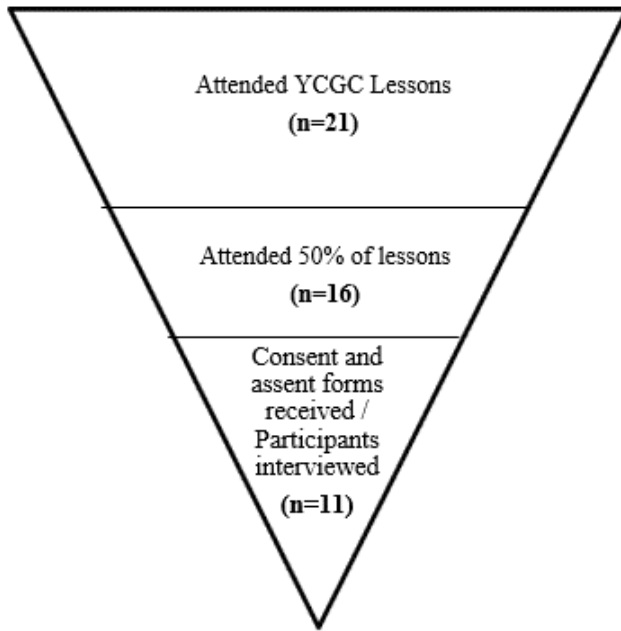


Figure 5. Participant Flowsheet

Additional research assistants from the Graduate Research and Outreach for Wellness (GROW) lab at the University of Tennessee who were not involved with lesson delivery or the interview process used the audio recordings and notes to transcribe the content verbatim for further coding and analysis.

Analytic Strategy

After the interviews were transcribed, they were coded independently by the principal investigator and a GROW lab research assistant who received training in social and behavioral research as well as training on the coding software, QSR International's NVivo 12 Software (Melbourne, Australia, 2018). The coders met several times throughout the process to discuss emerging code categories. A flowsheet of the coding process is illustrated in Figure 6. During the first meeting, a code-book was established by the coders based on their independent coding. The coders reviewed their coding line-by-line for discrepancies during each meeting. Inter-rater reliability was measured using percent agreement calculated by the coding software. A third reviewer, the Co-PI, resolved coding discrepancies between the two coders.

Interview transcriptions were analyzed using content analysis, a systematic method that uses coding to describe and interpret recorded data.⁷⁴ Transcriptions were coded using a complete thought as the unit of analysis. The coding process was conducted using NVivo. This software contains tools to assist with qualitative data management. Key features of the software include qualitative coding and data shaping.⁷⁵ Research assistants reviewed each interview transcript and recorded memos in the margins. Memoing assists researchers in identifying key ideas that were used to form

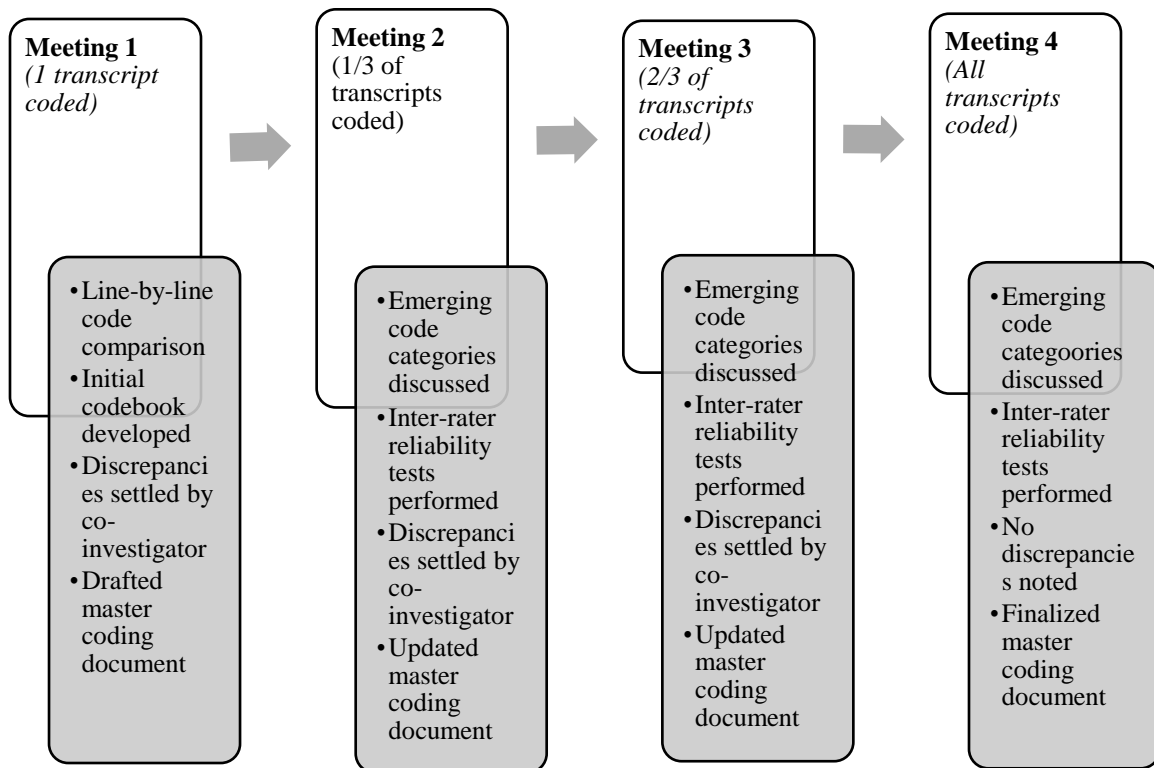


Figure 6. Flowsheet of Coding Process

initial codes⁷⁰ and to show relationships between codes.⁷⁶ A tentative list of codes was developed by each research assistant using the process of open and axial coding.⁷⁷ Axial coding was used to identify relationships among code categories that shared common ideas. As new data were reviewed, the research assistants coded relevant concepts into categories using the method of constant comparison. Following this method, existing categories were compared to emerging categories as new data were analyzed.⁷⁰ Saturation was determined by the research team once nine transcriptions were coded, at which point no new data related to research inquiries emerged into categories or sub-categories that were not previously identified. Saturation was confirmed by coding the two remaining transcripts, which revealed no new data related to the research inquiries. The research team developed maps of the relationship between the subcategories within each domain which emerged from the content analysis coding process.

Results

The demographic data for participants of the YCGC in-depth interviews are presented in Table 1 below. A total of 11 youth participated in the interviews, eight participants' parents or guardians completed the optional demographic survey, and three participants answered abbreviated demographic questions at the time of the interviews. The majority of the participants were females (64%) and the average age was 11 years. Most participants identified as a racial or ethnic minority. Nine participants identified as African American (82%) and one participant identified as Hispanic or Latino (13%). The eight participants whose parents or guardians completed the voluntary demographic survey came from varied socioeconomic backgrounds, as seen in Table 1 below.

Table 1. Demographic Characteristics of YCGC Participants

Characteristic	Frequency (%)
Child's Age	n=11
Mean yr (Std Deviation)	11 (1)
Child's Gender	n=11
Male	4 (36)
Female	7 (64)
Child's Race	n=11
White	1 (9)
African American	9 (82)
Other	1 (9)
Child's Ethnicity	n=8
Hispanic/Latino	1 (13)
Not Hispanic/Latino	7 (88)
Parents' Education level	n=8
High School	3 (38)
Some College	4 (50)
Bachelor's degree	1 (13)
Household Income	n=8
Less than \$50,000	5 (63)
\$50,000-\$75,000	2 (25)
Over \$100,000	1 (13)
Parent Race/Ethnicity	n=8
White	1 (13)
African American	6 (75)
Hispanic/Latino	1 (13)

Qualitative Results

The results of the content analysis reflect the design of the interview guide, which was developed by the research team to elicit responses from participants related to the study aims. The domains in which references were coded follow the structure of the interview guide, with the main categories that emerged encompassing community, healthy eating and nutrition, and research.

Community Content Analysis

One of the main categories that arose from the in-depth interviews was that of community. A map of the content analysis for the ‘community’ category is illustrated in Figure 7, along with representative quotes. The map displays the relationship between sub-categories, the number of references and sources for each category and sub-category, and the average age of the participants who were referenced. The ‘community’ category was divided based on the participant’s level of engagement with the community, diverging into the sub-categories of ‘community engagement’ and ‘lack of community engagement’. The average age of respondents from the ‘community engagement’ subcategory was one year above the overall average age of participants, whereas the average age from the ‘lack of community engagement’ category was one year below the overall participant average age. The most robust sub-category within ‘community’ was that of ‘self-efficacy to help the community’. A total of twenty-seven references from all eleven transcripts were coded into this sub-category, three of which were further coded into the sub-category of ‘community garden self-efficacy’. Representative quotes

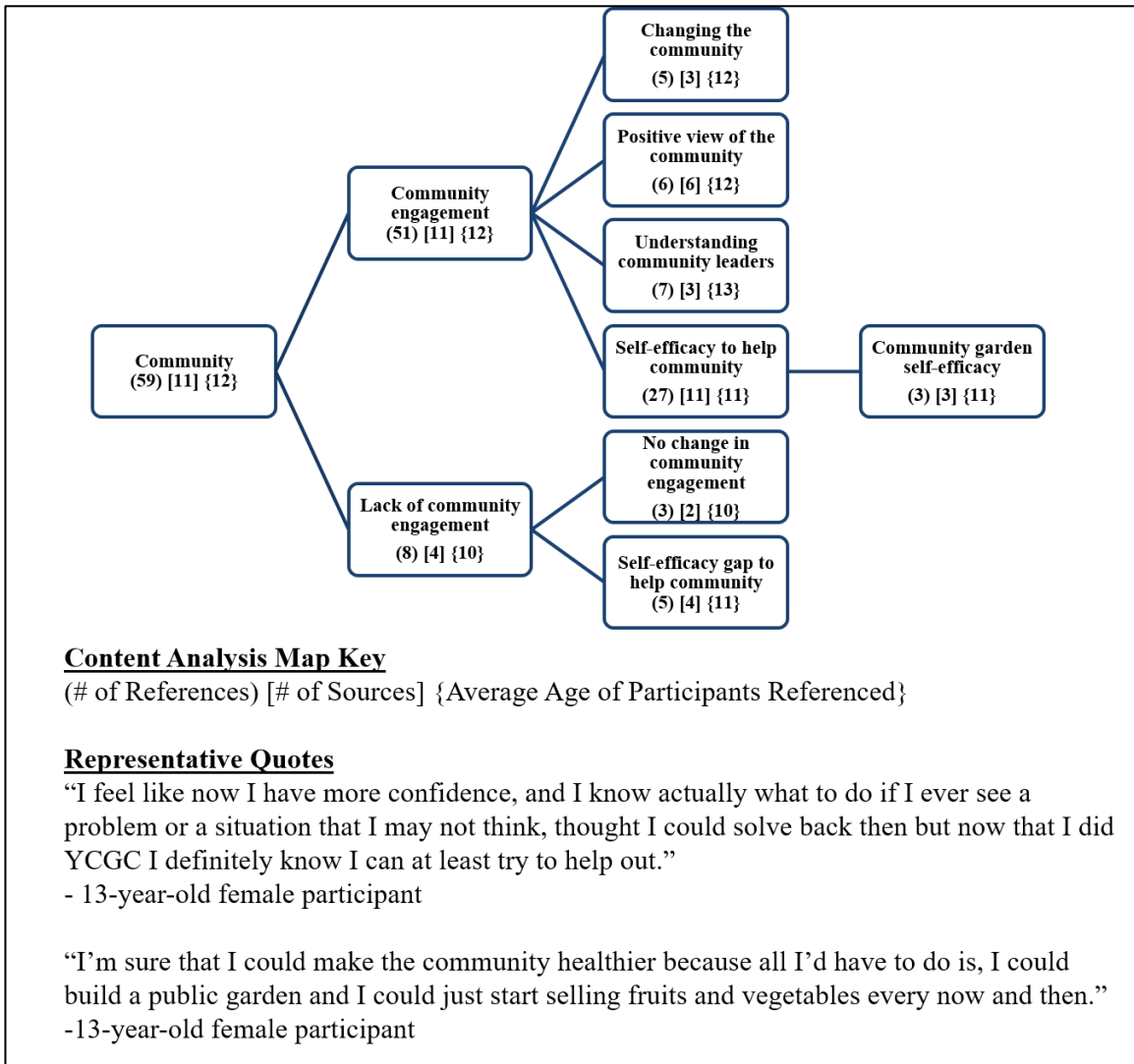


Figure 7. Map of Community Content Analysis with Representative Quotes

highlighted the youth's perceived self-efficacy to solve problems they may encounter in their community and to make their community healthier.

Healthy Eating/Nutrition Content Analysis

Another domain that arose from data analysis was related to healthy eating and nutrition. As shown in Figure 8, this category was further divided into healthy eating patterns that participants engaged in and information about nutrition described by the youth. Several participants identified healthy eating habits gained as a result of participation in the program, such as eating fewer sweets and trying new healthy foods. Related to the sub-category of healthy eating, youth provided their perceived barriers to healthy eating and offered solutions to encourage healthy eating. The sub-category 'nutrition knowledge' included quotations that expressed both gains and gaps in nutrition knowledge. The 'nutrition knowledge gain' sub-category was further divided based on different benefits of healthy eating that the participants described, including strength, increased lifespan, having a healthy body, functional improvements, having more energy, and preventing disease.

Research Content Analysis

The 'research' domain was divided into perceived research gains and perceived research gaps, as shown in Figure 9. This category was the least robust, with an equal amount of references coded into both 'research gain' and 'research gap' categories. Representative quotes displayed in Figure 9 reflect the divided nature of the 'research' category. Furthermore, both the 'research gain' and 'research gap' subcategories had an average age of 11, which indicates that there was no difference in the average age of

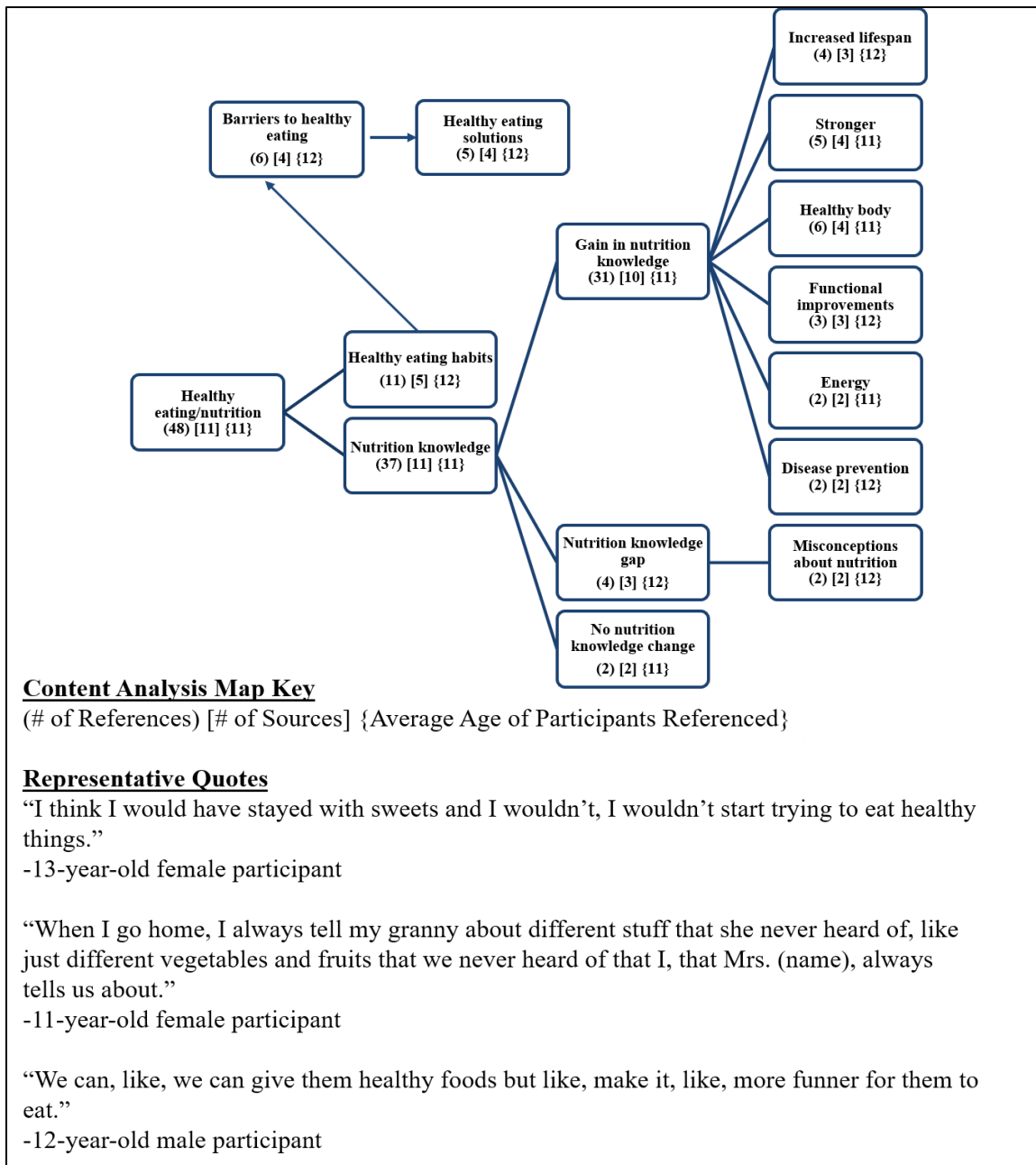


Figure 8. Map of Healthy Eating/Nutrition Content Analysis with Representative Quotes

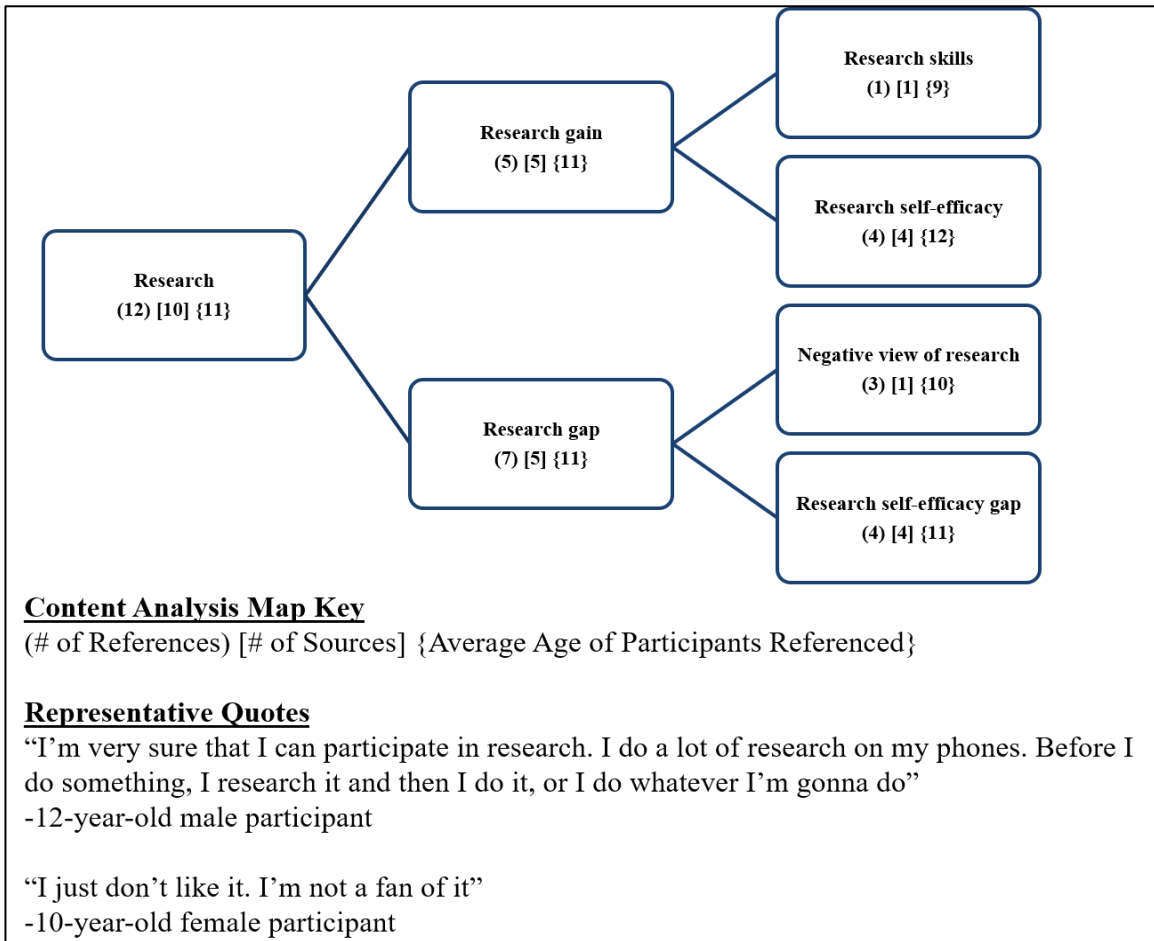


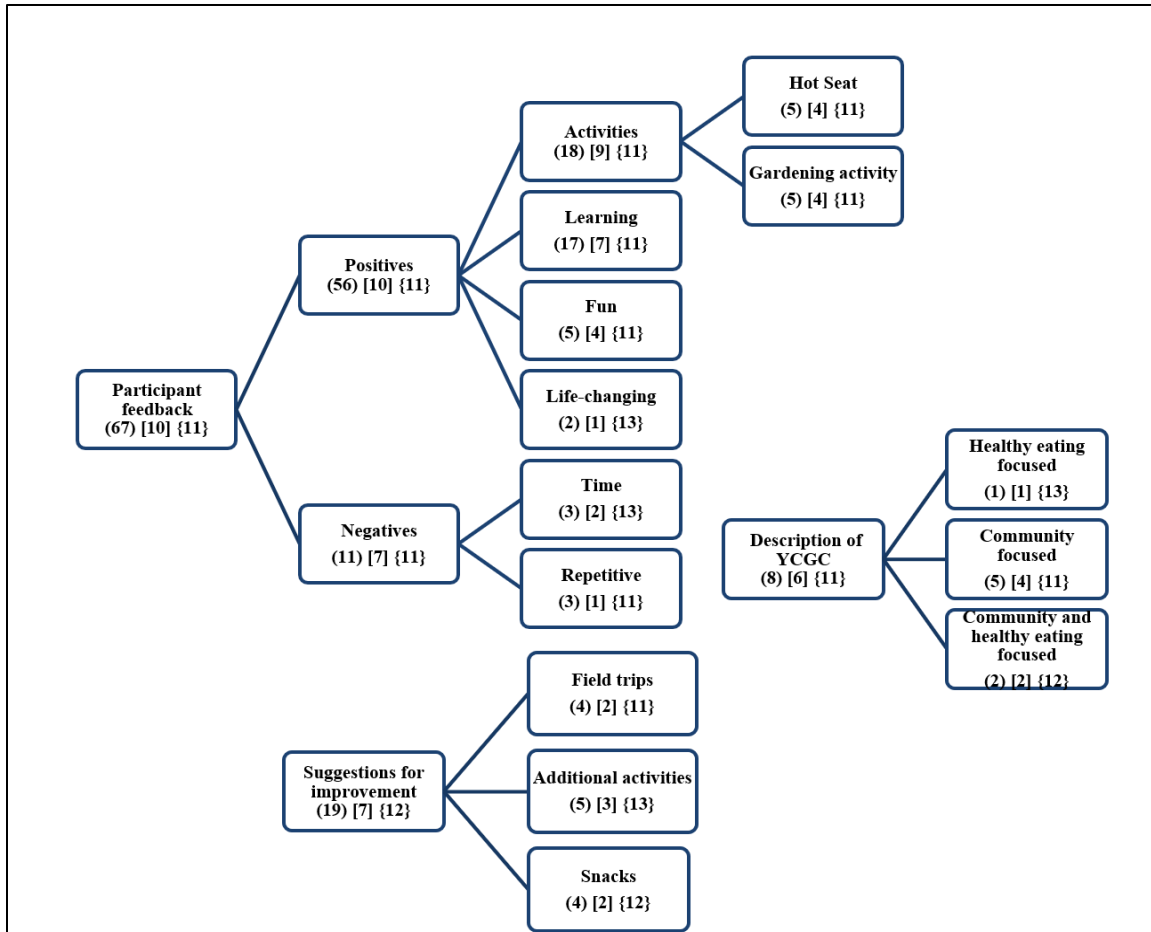
Figure 9. Map of Research Content Analysis with Representative Quotes

those who expressed gains in research and those who referenced lacking research skills and self-efficacy. Within the ‘research gain’ sub-category, one youth displayed research skills when asked “how would you help fix [your community]?” by responding, “first I needed to know what the problem is.” The research team felt that this response indicated an understanding of community assessment in the context of research.

Additional Findings

In addition to learning about participants’ perceptions related to the project objectives, youth revealed aspects of the program that were most valued and ways to improve the program (Figure 10). Participants provided several positive aspects of the program related to learning, fun, activities, or the life-changing nature of the program. Two specific activities were mentioned repeatedly by youth, “hot seat” and a gardening activity from Growing Profits. Although hot seat was not initially an official part of the curriculum, it was added as a team-building activity to help the participants review concepts as a group. The activity involved the youth breaking into two teams and competing to describe vocabulary words to their team leader who would attempt to guess the word first to score a point for the team.

Participants also described negative aspects of the program, including “time” and “repetition”. Youth expressed dissatisfaction regarding the length of the program, which several participants perceived to be too long. Another concern was the repetitive nature of the content of the program. Beyond providing feedback on their favorite and least favorite aspects of YCGC, participants also offered suggestions for improvement. Youth



Content Analysis Map Key

(# of References) [# of Sources] {Average Age of Participants Referenced}

Representative Quotes

“We would pair together and talk about it and we’d come up with our own ideas and if I didn’t come, I wouldn’t just think of that”
-11-year-old female participant

“...because, it’s like, we build gardens here and we should have the opportunity to go see gardens anywhere”
-11-year-old female participant

“It changes lives. It, um, it can help change lives,”
-13-year-old female participant

Figure 10. Map of Participant Feedback Content Analysis with Representative Quotes

mentioned a desire to have snacks to sample, an interest in taking field trips, especially to gardens, and an interest in adding additional activities to the curriculum.

Discussion

The results of this study suggest that although YCGC participants received lessons and participated in designing their own research project, they did not seem to perceive an increase in self-efficacy to engage in research. These results contrast with the findings from the 2012 study by Ozer and Wright,⁶¹ which involved considerably older participants than the YCGC research project. The high school participants in Ozer and Wright's study recognized the new professional roles they adopted as student researchers that went beyond their typical roles as students and led to changes in their self-perception. However, the results of this qualitative data analysis suggest that the participants of YCGC were divided based on their perceived ability to participate in research. Furthermore, there was no difference in the average age of those who referenced research gains and those who seemed to express a gap in research skills and self-efficacy. It is possible that the participants of YCGC were not aware that they were participating in the early stages of research design.

Despite the lack of self-efficacy perceived by the youth of this study to participate in research, their overall responses seem to reflect a gain in self-efficacy to help their community. This finding is similar to the qualitative results from the 2015 study by Woodgate and others which support the ability for youth to gain self-efficacy to help others after participating in a PYD program.⁵⁰ Youth in Woodgate's study reported an increased ability to help others stop smoking and to promote cardiovascular health to

their peers. Participants of this 2015 study also reflected on the life-changing nature of the program,⁵⁰ a sentiment that was expressed well by one YCGC participant (Figure 10).

The feedback that youth provided during their interviews can be used to strengthen future iterations of the program. Additionally, the findings can be incorporated into the design of similar youth development programs to increase engagement.

Interactive activities such as games, craft activities, and group drawings were more likely to result in a high level of engagement whereas discussions and worksheets were generally associated with a lower level of engagement. These findings are consistent with the formative evaluation of the Youth Can! curriculum by Carberry and others,⁶³ which found that youth enjoyed creative processes, missions, and experiential activities more than purely didactic strategies. While the research team took this formative evaluation into consideration when designing the YCGC curriculum, it was necessary to include some background and didactic information to properly train the youth and provide them with the skills necessary to participate in research. Therefore, some lessons and handouts were included in the curriculum despite their anticipated low level of participant engagement. Components suggested by the YCGC participants such as field trips and taste tests can inform future studies as potential strategies to increase engagement.

The study provides insight into a novel approach to target youth diet quality by engaging youth in research to improve nutrition- and other health-related factors in their community. Participants described healthy eating habits gained from the program similar to the positive eating changes described in the student interviews by Gutuskey and others.⁴¹ The participants of Gutuskey's study described changes that occurred both at school and at home such as eating fewer sweets and substituting junk food with healthier

snacks. Similarly, several participants of YCGC reported gaining healthy habits, including eating fewer sweets, as a result of the program. Several YCGC study participants were able to examine their personal barriers to healthy eating and provide solutions to overcome these barriers. The participants' ability to examine their own barriers revealed problem-solving skills. The youth demonstrated an understanding of how to identify the root causes of problems and how to propose alternative solutions, both of which were identified as subprocesses of problem-solving thinking by Bandura.⁶⁶ The identification of barriers to one's goals and subsequent generation of solutions to overcome those barriers is an evidence-based behavioral strategy⁷⁸ used in nutrition interventions^{79, 80} with successful results. Based on the SCT, the behavioral changes identified by the youth coupled with their problem-solving skills and knowledge and the environment they helped shape through participatory action research could combine to improve their overall health-related actions.

Limitations

This study benefitted from its unique design which provided nutrition and gardening education and involved youth in participatory action research while fostering youth development. However, the study was not without its limitations. One of the main limitations was the study's relatively small sample size. Due to the nature of the SKIP program, youth were able to leave the program towards the end of the summer. This led to early dropouts, with several youth who had attended all of the lessons in the program leaving prior to the interviews. While the research team was able to interview 69% of the youth who had attended at least half of the lessons and saturation was reached for the

research questions, it is possible that additional interviews could provide more content to add to the richness of the data.

As with any qualitative study, the results may have been influenced by social desirability, which could have prevented participants from sharing negative feedback. However, the interviews were conducted by researcher assistants who were not involved with delivering lesson plans to reduce the potential for social desirability bias. Finally, the fidelity checklist was performed by the research team. Ideally, an observer not affiliated with the research team would have completed the checklist to ensure objective data related to participant engagement.

Conclusion

The results of this qualitative study of a gardening-enhanced nutrition education program suggest that participants of the program did not gain self-efficacy to perform research despite receiving training and designing a project to use the produce from their facility's garden to make their community healthier. However, participants expressed self-efficacy to improve nutrition- and other health-related aspects of their community. Additionally, several participants reflected on healthy eating patterns gained from the program and demonstrated problem-solving capabilities by identifying potential solutions to perceived barriers to healthy eating. The unique curriculum design, which combined YPAR and PYD strategies to provide gardening-enhanced nutrition education, could be used as a model to engage youth in community-level health solutions.

CHAPTER 3: EXPANDED METHODOLOGY

Project Overview

The purpose of this research project was to evaluate a gardening-enhanced nutrition education program with PYD strategies that assisted youth in developing research skills. This study had a qualitative design to provide a deep understanding of participants' experiences. Youth participated in a novel program which combined gardening, nutrition, and PYD materials used in previous studies. The lessons culminated in youth developing their own action plan to improve the nutrition- and other health-related aspects of their community. The program was evaluated using in-depth interviews and analyzed using content analysis. This project received approval from the University of Tennessee Institutional Review Board, IRB Number UTK IRB-18-04450-XP.

Participant Recruitment

Youth were encouraged to sign up for the Youth Can! Grow in Communities (YCGC) program through the YWCA SKIP program. A flyer (Appendix F) was developed by the principal investigator and advertised at the YWCA to promote the program. Enrollment was capped at 25 participants between the ages of 9 and 14 years. Inclusion criteria for participation in the evaluation study included: participation in YCGC, attendance in at least 50% of the YCGC program lessons, and ability to communicate in English. Due to the nature of the facility, the participants were not required to attend all lessons and several participants did not stay for the entire duration of the program. An exclusion criterion was established to ensure that interview participants had attended enough lessons to have an understanding of the program to

successfully participate in the program evaluation. Under this criterion, youth who had not attended at least 50% of the lessons were excluded from the study interviews. A weekly sign-in sheet was maintained to determine participation rates.

An informed parental consent form, youth assent form, and optional demographic survey were given to each participant's parent or guardian to take home. These forms have been included in Appendix A, B, and D respectively. Parents were encouraged to read the information on the informed consent form and, if willing, complete the demographic survey and sign the informed consent form. The short demographic survey (Appendix D) provided information on participants' age, gender, race, and ethnicity. These data were used to generate descriptive statistics. Participants were encouraged to discuss the assent form with parents, which they signed and returned to the principal investigator prior to participating in interviews. Additionally, researchers verbally reviewed the details of the interview process and the voluntary nature of the study with participants prior to the interviews. Both a signed informed consent from a parent or guardian and a signed assent form from youth participants were obtained prior to the collection of data, which occurred at the end of the program. Youth who were missing either or who failed to meet inclusion and exclusion criteria were allowed to participate in the YGCG program but were not involved in the interview process.

Incentives

Participants received incentives both to prevent dropout in the early stages of the program and to encourage participation in the interviews upon completion of the program. During week 1, youth designed YCGC logos and voted on a winning design

(Appendix G) to represent the program. The winning design was transformed into t-shirts which youth received at the end of the program as an incentive to attend lessons. In addition, youth received one \$5 Target gift card as an incentive to participate in the one-on-one interviews upon completion of the program.

YCGC Lessons

The program was held during a period of eight weeks during the SKIP program at the YWCA. Participants attended hour-long lessons taught by a trained research assistant twice weekly. One scheduled meeting time coincided with a holiday, and the planned activities were interspersed into later lessons. Therefore, a total of fifteen lessons were held throughout the eight-week period. The program combined lessons from Youth Can!,⁶³ Extension's Growing Profits,⁷¹ and the Michigan Model for Health lessons intended for grades 7-8 titled "A Winning Team: Healthy Eating and Physical Activity".¹⁶ The units from Youth Can! served as a foundation for the structure of the program, and lessons from Growing Profits and the Michigan Model for Health were incorporated into relevant units. The final unit called "Participatory Action", comprised of the YPAR component of the study, was added by the research team. A summary of the activities in each unit can be reviewed in Table 2 below. Furthermore, a detailed list of all YCGC lessons is outlined in the fidelity checklist in Appendix C. Several activities were excluded from the curriculum due to constraints of the study location. For example, since the community center already had an established garden, lessons on garden preparation were omitted. Additionally, since the program focused on nutrition education, the physical activity lessons from the Michigan Model for Health were excluded.

Table 2. Schedule of YCGC Activities

Unit	Week	Summary of activities
Unit 1: Team Building	1	Youth participated in team-building activities, designed the YCGC logo, and participated in interactive gardening activities.
Unit 2: Taking Pride	2	Youth discussed their local food environment and learned about MyPlate and the benefits of healthy eating. Youth decided on project and invited community leaders to panel discussion.
	3	
Unit 3: My Healthy Body	4	Youth reflected on their eating habits and reviewed nutrition recommendations. Youth developed a portrait of a healthy eater and designed a healthy community.
Unit 4: Research for Change	5	Youth researched career options, assessed their community, and selected their project.
Unit 5: Communicating with my Community	6	Youth participated in the community leader panel discussion.
Unit 6: Participatory Action	7	Youth created the Power Ladder and prepared their action plan.
	8	

The lessons were designed to provide youth with training on nutrition, gardening, and research to equip them with the knowledge and skills necessary to participate in developing a research project and action plan. During lesson 10, participants designed a project to use the produce from the YWCA garden to improve the nutrition-related health of their community. As the program progressed, youth had the opportunity to participate in a panel discussion with community leaders where they asked questions about the leaders' roles in the community and received mentorship on their research endeavor. During the final unit of the program, the youth collaborated to design an action plan, which they presented at the community center's end of the summer gathering in front of the facility's director, their peers, and family members.

Fidelity Checklist

A fidelity checklist, available in Appendix C, was developed by the research team to document field notes as well as any deviations from planned lessons. The principal investigator documented the length of each lesson, the format in which the lesson was delivered, and any modifications to the original lessons that were made. Additionally, the principal investigator documented the overall perceived engagement of the participants during each lesson as well as any noteworthy occurrences. Lesson modifications were mostly made to shift the focus of the Growing Profits lessons from business development to community engagement.

Evaluation Tool

The interview guide was developed by the principal investigator and co-investigator to elicit information from participants related to the program objectives. An

initial interview guide was developed by the principal investigator and reviewed and revised by the co-investigator. The final interview guide is located in Appendix E. Several questions were taken from previously used surveys and others were created by the research team. The question regarding the benefits of healthy eating was adapted from the Michigan Model for Health grade 7-8 nutrition and physical activity pre-/post-test.¹⁶ Questions related to ‘enjoyment of the program and suggestions for improvement’ were developed based on generic open-ended question stems.⁸¹ Questions from the Youth Can! Grow Healthy Survey⁶³ were adapted to structure the interview questions related to ‘self-efficacy to engage in research’. Questions related to ‘level of intent to be active in the community in the future’ were developed by the research team.

Data Collection

Semi-structured interviews were conducted by three interviewers who received training in social and behavioral research. Additionally, the interviewers met with the principal investigator to review the interview guide and procedure prior to the study evaluation. All interviews were held after the last YCGC lesson over the course of two days. All eligible participants who had attended at least 50% of lessons and who provided signed assent and consent forms were interviewed. In addition to the assent and consent forms, which were collected prior to the study evaluation, the research team explained the interview process to participants and obtained a verbal consent prior to their involvement in the interviews. The interviews were audio-recorded using a digital recorder and a backup recording device. Participants were assigned identification numbers which were used to de-identify their audio-recordings. Interviewers were encouraged to take notes on

all non-verbal communication expressed. Documentation of non-verbal communication was provided to transcriptionists to incorporate into the interview transcripts.

Qualitative Data Analysis

All audio files were transcribed verbatim by GROW Lab research assistants who received training in social and behavioral research. All transcriptions were coded independently by the principal investigator and a trained research assistant using QSR NVivo 12. The coders worked independently on separate copies of a document, which contained all eleven interview transcripts. The latent content of the quotations was interpreted rather than the specific wording, and a complete thought was used as the unit of analysis. Inter-coder reliability was assessed by merging the copies into one file and calculating the percent agreement using NVivo QSR software. In accordance with the qualitative research sourcebook by Miles and Huberman⁷², inter-coder reliability was assessed by check-coding early on after the first 1/3 of transcripts were coded, as well as roughly two-thirds of the way through the data analysis. The coders met over the course of the data analysis to review codes and to discuss emerging coding categories. The coders met initially, after coding 1/3 of the transcripts, after coding 2/3 of the transcripts, and once all transcripts were coded. Researchers were encouraged to use NVivo's memo function to make note of potential emerging categories and relationships between categories. Following the constant comparison method, previously coded references were reassessed as new categories emerged.

The coding process followed an inductive technique in which the coders developed their own open codes. Although the researchers were not provided with a list

of codes to draw from, they were encouraged to review the research objectives and the interview guide to help structure their coding. The researchers met after coding the first transcript to discuss emerging categories and to develop an initial codebook. During this meeting, inter-rater reliability tests were not performed since the researchers had coded into discrete nodes. The researchers reviewed each line of code and discussed all discrepancies between the codes to reach an agreement on the initial nodes. After this initial meeting, all coding discrepancies were settled by the co-investigator of the study. A master code document was developed at this time. Once discrepancies were settled, the agreed-upon codes were coded into the master code document following each meeting.

During the second meeting after approximately 1/3 of transcripts had been coded, the inter-rater reliability tests were performed. The percent agreement was determined by running a coding comparison in NVivo and averaging the values generated for the nodes that at least one researcher had coded into. At this point, percent agreement had reached 95%. Check-coding subsequently occurred after approximately two-thirds of the transcripts were coded. At this point, the percent agreement had reached 98%. The inter-coder reliability tests for the final transcript revealed a percent agreement of 97%. Coding discrepancies for all transcripts were settled by the co-investigator after the meetings where check-coding occurred. Final codes were coded into a master coding document which was used to perform qualitative analyses.

After all transcripts were coded into the master coding document, the principal investigator reviewed the codes and made memos with relationships among categories and potentially miscoded quotations. Frequency counts were conducted to rate how often the codes appeared in the interview transcripts, and the average age of participants who

were referenced in each code category was calculated. The principal investigator developed a map which visualized the relationship among code categories and the frequency of references within categories in the form. The coders met one final time to review all memos and data visualization created by the principal investigator.

Suggestions made during this meeting were incorporated into the data analysis, and the final data visualization models were reviewed and approved by the co-investigator. The maps visualized the total number of references, total number of sources, and average age of the subject for the references in each category and sub-category. The research team then drew conclusions based on the frequency of the codes within each category and the relationships identified between sub-categories.

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APPENDICES

Appendix A. Informed Consent

YCGC Consent Form: Participants

INFORMATION SHEET & PARENTAL CONSENT FORM FOR Youth Can! Grow in Communities Participants

Your child is invited to participate in an evaluation research study by the Department of Nutrition at the University of Tennessee during the YWCA's Summer Kids in Play (SKIP). This is a student research project by Marissa Black under the supervision of her adviser, Dr. Marsha Spence. The purpose of this study is to evaluate a nutrition education, gardening, and youth development program. This program is designed to involve youth in creating a project to improve their research knowledge, nutrition knowledge, and intent to be active in their community in the future. Your child will be participating in the Youth Can! Grow in Communities (YCGC) program, and we would like to request your consent to use the materials he/she creates as part of their program activities for the research study. This includes things like action plans, community leader lists, any photographs of the community or garden taken by your child, and action plans he/she may create and present to community leaders. In addition, we'd like them to participate in an interview during the last two weeks of the program to help us evaluate the program and make improvements.

What will you and your child be asked to do?

If your child is enrolled in the evaluation of the YCGC program, he/she will be asked to do the following:

- Allow us to use materials developed during the YCGC program for evaluation/research purposes (nothing that will identify your child will be used).
- Sign a daily attendance form which will be collected.
- Provide assent and participate in a recorded interview at the end of the program.

If your child does not participate in the evaluation portion of the YCGC study, he/she will still be able to participate in the YCGC program.

Additionally, you will be asked to do the following:

- Fill out the attached survey to provide us with information about you and your child.

This information in the attached survey will only be used to describe the overall population of YCGC participants. We will not make any personal references to information that could be linked to you or your child. Completion of this form is voluntary and will not prevent your child from participating in the study.

If you and your child agree to participate, and you do not complete this form, your child will be asked for this information during the interview.

Benefits to Participation. There are no real benefits to your child for allowing use of these materials or the survey for the research. However, they may enjoy providing information for the study. Additionally, the evaluation will provide the field of nutrition with information on potential ways to motivate youth to make positive changes in their community using gardening and nutrition education with youth development strategies.

Risks to Participation. The risks associated with the participation in the research component are minimal and no more than those encountered in daily life. If your child does not want to allow use of his/her program materials or participate in any or all of the interview, his/her decisions will not impact their participation in the YCGC program or their relationship with the YWCA in any way.

Compensation. If you consent and your child agrees to participate, he/she will receive one \$5.00 Target gift card for allowing us to use his/her program materials and participating in the interview during the last two weeks of the program.

Please see next page.

IRB NUMBER: UTK IRB-18-04450-XP
IRB APPROVAL DATE: 06/29/2018
IRB EXPIRATION DATE: 06/28/2019

Appendix B. Assent Form

Assent Form

Youth Can! Grow in Communities Assent Form

Your parent or guardian agreed that you could participate in the Youth Can! Grow in Communities program. We will meet two times per week during the Summer Kids in Play for an hour. We will complete activities so that you learn about nutrition, gardening, and how to design an action plan to make your community healthier. At the end of our meetings, we will ask you to participate in an interview to answer questions about research skills you learned, nutrition knowledge, and if you will try to make changes in your community and to let us use the attendance sheet and materials that you might develop to help us learn more about what worked well in the program and what didn't. If you don't want to do the interview or let us use your materials, you will still be able to participate in the program.

The attendance sheets, program materials, and the interviews are parts of a research study at the University of Tennessee to help us find out about how kids can help make their communities healthy. The risks associated with being in the program or participating in interviews are no more than you would have on any regular day. If you are uncomfortable, then you are not required to participate in the interview or may choose not to answer specific questions during the interview.

We'll keep the recording of the interview, attendance records, and any materials made during the program in a safe place so that no one except my study staff and I can hear your answers. We will not speak or write about you in a way which could link you to the program, nor use any pictures that can identify you when we speak to others about our research.

Your participation in the program and completing the interview is voluntary; you may decide not to participate without any problems. If you do decide to participate, you may quit at any time without getting in trouble.

If you want to participate, please sign below:

<hr/> Name (Print)	<hr/> Name (Sign)	<hr/> Date
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IRB NUMBER: UTK IRB-18-04450-XP
IRB APPROVAL DATE: 06/29/2018
IRB EXPIRATION DATE: 06/28/2019

Appendix C. Fidelity Checklist

Lesson	Activity	Source	Interactive processes	Length	Participant Level of Engagement	Adaptations	Notes
1	Expectations	Youth Can!	Discussion	10 min	Moderate		
	Saving Starfish	Youth Can!	Craft	25 min	Moderate		
	Make Waves	Youth Can!	Interactive activity	20 min	Moderate		
2	It's In-Between	Growin g Profits	Discussion	10 min	Moderate		
	Logo Design Contest	N/A	Craft	25 min	Moderate		Some participants were frustrated due to (self-proclaimed) lack of artistic ability.
	Look Ma- No Soil!	Growin g Profits	Interactive activity	25 min	High		Youth volunteered to participate. Several youth seemed interested in the fertilizer component s.
3	Sharing Food Stories	Youth Can!	Interactive activity	30 min	High	Local cookbooks were passed around and youth were asked to choose one recipe to share with the group	

	What Foods are Grown Here	Youth Can!	Discussion	10 min	Moderate		
	Where Can I Find Local Foods	Youth Can!	Hand outs	10 min	Moderate	Advertisement not made since this was a component of YCIC	
4	Telling Tall Tales	Youth Can!	Story telling	10 min	Low		Youth were not sure how this related to YCGC
	Rumors about Nutrition and Physical Activity	Michigan Model for Health	Interactive game	20 min	High	Rumors presented as a trivia game with small prizes such as stickers and plastic bracelets	
	Why is it Important to Eat Healthy	Michigan Model for Health	Interactive drawing	20 min	High		
5	Taking Action in Your Community	Growing Profits	Discussion	10 min	Moderate		
	Identifying Community Leaders	Youth Can!	Technology	45 min	Moderate		iPads used to look up leaders
6	Letter Writing	Youth Can!	Technology	45 min	Moderate	Team building exercise added (Hot Seat)	
7	Using MyPlate and Daily Food Plans to Improve Eating and Physical Activity Habits	Michigan Model for Health	Discussion	10 min	Low		
	Eating Healthy Foods at Home	Michigan Model for Health	Worksheet	15 min	Low		
	Placemat Portraits	Youth Can!	Craft and scavenger hunt	25 min	High		

8	Assessing the Food & Nutrition Environment & Making the Lists	Youth Can!	Discussion	10 min	Moderate		
	What is a Healthy Community?	Youth Can!	Craft, group work, presentations	50 min	High	Participants received assistance from high school volunteers	Youth spent a lot of time perfecting their communities and seemed to enjoy collaborating with volunteers
9	All About You	Growing Profits	Worksheet	20 min	Low		
	Is it for me?	Growing Profits	Technology, discussion	40 min	Moderate		
10	Growing a Community	Growing Profits	Group discussion	40 Min	Moderate	Growing a business modified to Growing a community to reflect the project goals	
	Preparing for Community Leaders Visit	Youth Can!	Discussion	20 Min	Moderate		
	Youth Can! Newspaper	Youth Can!	Craft, teamwork	10 Min	Low		Youth seemed exhausted after Growing a Community activity and did not come up with much content for the newspaper.
11	Community Leaders Visit	Youth Can!	Interactive discussion	60 Min	High		Youth asked community leaders their questions and shared their

							project with them. Interesting notes from the event include: School meals lacking flavor, school breakfast does not have enough vegetarian options, some youth feel that eating healthy is socially less acceptable in the black community and eating a salad might make someone “look white”. Others felt that the biggest barrier to healthy eating was the amount of fast food in their community .
12	Thank you Letters	Youth Can!	Craft	30 min	Moderate		
	Defining and Discussing the Words Advocate, Power, and Youth Empowerment	Youth Can!	Match game, discussion	15 min	High	The words ‘action plan’ and ‘leader’ were also defined.	Youth were quickly able to match all words to their definitions.

	Working up the Power Ladder	Youth Can!	Interactive discussion & drawing	15 min	High		
13	D is for Diplomat and Dog	Youth Can!	Craft and discussion	35 min	High		
	What do We Want?	Youth Can!	Discussion	15 min	Moderate		
14	Communicating the Plan to our Leaders	Youth Can!	Discussion, role-playing	15 min	Low		
	Talking about our Plan	Growing Profits	Discussion, rehearsal	45 min	High	'Talk About It' activity modified for youth to talk about their action plan.	Youth created their action plan, and almost every participant contributed to the speech.
15	Taking a Look Back	Youth Can!	Discussion	20 min	Moderate		
	Rehearse Action Plan	N/A	Rehearsal	40 min	High		Youth were excited to have costumes for their presentation

Appendix D. Demographic Survey

Parent Survey

Thank you for agreeing to take part in this study. Please provide information about your child and yourself.

Your child's name: _____

1. What is the highest education you have obtained?

- Grammar school
- High school
- Vocational/ Technical school
- Some college
- Bachelor degree
- Graduate degree

2. What is your income level?

- Less than \$50,000
- \$50,000-\$75,000
- \$75,000-\$100,000
- Over \$100,000

3. What is your race/ethnicity? (please check all that apply)

- White
- Black
- Hispanic
- Asian/Pacific Islander
- Native American
- Other _____

4. Is your child male or female?

- Male
- Female
- Prefer to not answer

IRB NUMBER: UTK IRB-18-04450-XP
IRB APPROVAL DATE: 06/29/2018

5. What is your child's age? _____

6. What is your child's race? (please check all that apply)

- White
- Black/African American
- Asian
- Hawaiian/Pacific Islander
- Native American
- Other _____

7. Is your child Hispanic/Latino?

- Yes
- No

IRB NUMBER: UTK IRB-18-04450-XP
IRB APPROVAL DATE: 06/29/2018

Appendix E. Interview Guide

Youth Can! Grow in Communities Interview Guide

Date:

Location:

Interviewer:

Interviewee:

Instructions:

Please read the youth assent form prior to the interview. If the demographic form was not returned by the participant's parents, please ask for the following:

Age:

Gender:

Race:

Questions:

Introductory Questions

- How would you describe YCGC to someone?
- If you could say just one good thing about the program, what would it be?

Level of intent to be active in the community in the future

- How do you feel about your community after YCGC?
- If you found a problem in your community, what would you do?

Self-efficacy to engage in research

- How sure are you that you could participate in research?
- How sure are you that you can make your community healthier?

Nutrition knowledge

- What do you feel like you learned about healthy eating from YCGC?
- What do you think are benefits of healthy eating?
- How could we help more kids eat healthy?

Enjoyment of the program/suggestions for improvement

- What do you think would be different about you right now if you hadn't been a part of YCGC this Summer? Why?
- What did you like most about the program? Why?
- What was your favorite activity? Why?
- What did you like least about the program? Why?
- If you were in charge and could make one change about the program, what would it be? Why?
- If you were in charge, tell me one thing you'd like to add to the program, what would it be? Why?

Closing Question

- Is there anything else you would like to share about your experience with YCGC?

Thank you for participating in this interview. Your response will not be shared with anyone outside of the research team.

Sample probes for more detail:

- Can you give me an example?
- Tell me more about that.
- What was that like for you?

Sample probes for unclear answers

- Would you explain that?
- What do you mean?

Appendix F. Recruitment Materials







THE UNIVERSITY OF
TENNESSEE
KNOXVILLE

Youth Can! Grow in Communities

An exciting opportunity to design a project to help your community through gardening!

Learn how to:

-  Design a research project
-  Grow and sell produce
-  Make healthy food choices
-  Communicate with community leaders



Youth Can! Improve their Communities will meet twice per week, for one hour each meeting during the Summer Kids in Play. The program will last for 8 weeks. It will begin on _____ and end on _____.

Ask the YWCA staff how to enroll in this fun program! The program will be limited to the first 25 kids who sign up

Appendix G. YCGC Logo



VITA

Marissa grew up in Gainesville, Florida where she graduated from the University of Florida with Bachelor of Arts degrees in business administration and Japanese. She grew interested in the field of nutrition after working as a data manager for a clinical trial at the University of Florida Department of Pediatrics Division of Genetics and Metabolism. Marissa graduated with a Master of Science degree in Nutrition with a concentration in Public Health Nutrition in Summer 2019. She completed her didactic program in dietetics coursework while fulfilling graduate requirements and completed the University of Tennessee Dietetic Internship during Spring and Summer semesters, 2019. Marissa has a passion for child and adolescent nutrition and served as a funded trainee for the Maternal and Child Health Nutrition Leadership and Education Training Program. She led several afterschool nutrition programs at schools around Knox County during her tenure as a graduate student. She completed her block field experience at the University of Florida/Institute of Food and Agricultural Sciences Extension Family Nutrition Program, working with low-income children and families who are eligible for the Supplemental Nutrition Assistance Program. She will sit for the Registration Examination for Dietitians after graduation.