HOPE GROWS: A garden-based intervention for survivors of youth cancer

Submitted by:
Colleen Spees
Associate Professor
College of Medicine
6142669234
spees.11@osu.edu

Project Information: Abstract
In the U.S., cancer is the leading cause of death past infancy in children ages 0-19. For survivors, over 65% face lifelong health issues, with 25% being life-threatening. Increased risks for late effects of curative therapy include secondary cancers, metabolic syndrome, organ toxicities, and chronic disease. Comprehensive interventions that mitigate treatment effects are paramount to improving long-term quality of life and life expectancy for this vulnerable population. HOPE GROWS is a novel, garden-based program aimed at improving the health and well-being of families affected by cancer.

Project Information: Narrative
Diet and physical activity are critical factors for optimal cancer survivorship given their impact on mitigating the late effects of cancer therapy including obesity, chronic fatigue, inflammation, and cardiometabolic complications. Interventions that address behavioral, social, and environmental strategies are essential in promoting the health and well-being of families affected by cancer. Research supports: 1) the more children learn about food and nutrition, the likelier they are to consume fruits and vegetables; 2) the more children cook and prepare food, the likelier they are to appreciate healthier and more varied ingredients; and 3) the more children plant and harvest produce, the more motivated they are to eat them. Further, garden-based experiential learning has proven to boost academic achievement, increase acceptance of produce, and improve overall dietary patterns.

HOPE GROWS is a novel, biobehavioral lifestyle intervention adapted from our established program for adult survivors that has documented significant improvements in dietary and physical activity patterns, cardiometabolic profiles, and quality of life. The specific program components include 10 group sessions for families focused on evidence-based nutrition education, physical activity, weekly produce harvesting, behavioral parenting skills, remote motivational health coaching, and access to a secure eHealth web portal. Our garden is located on OSUs main campus at Waterman Farm, a 261-acre living laboratory, devoted to discovering scientifically-proven methods to empower and inform families in achieving optimal health and wellness. Each season, crops are varied and specifically selected...
to align with local availability. Since its launch in 2012, the 3-acre Garden of Hope has been the stage
in which to provide education, shared kinship, healing, and empowerment to families in need. A summary of our preliminary data are listed below:

2013 Study. Focus groups highlighted numerous advantages reported by adult cancer survivors harvesting at the garden. The main themes related to improvements in physical and mental health as well as increased socialization providing additional support and motivation.

2014 Study. Twenty adult cancer survivors, post active treatment, were observed in a pre- to post-test pilot to assess the feasibility and efficacy of our garden-based intervention over a 4-month period. 100% of participants reported that the program helped them achieve positive lifestyle behaviors that were sustained 6-months post-intervention. 100% rated the program as very good/excellent, and stated they would recommend the intervention to others. Consumption of fruits and vegetables significantly increased while consumption of red and processed meats and sugar-sweetened beverages decreased. Skin carotenoid levels, fasting blood glucose, and non-HDL cholesterol also significantly improved.

2015 Study. The 2014 intervention was repeated with overweight and obese cancer survivors (N=29) for 6 months. Again, we documented significant improvements in fruit and vegetable intake and quality of life. Healthy Eating Index scores, body mass index, waist circumference, total cholesterol, blood pressure, skin carotenoids and plasma carotenoid concentrations. In addition, physical activity increased by 20% over the course of our intervention.

2016 Study. Next, we modified our successful adult intervention to meet the needs of youth, ages 8-11 years, from low-income communities. Within 3 weeks, we recruited and enrolled 30 families to participate in a 10-week summer pilot. This study was feasible with >85% retention rates. Families reported improvements in fruit and vegetable intake and physical activity. Moreover, parents reported that the program increased their family's exposure to new fruits and vegetables, and their children became more adventurous eaters.

2017 Pilot. In collaboration with Nationwide Childrens Hospital, we conducted a pilot for survivors of youth cancer (ages 8-11) and their primary caregivers (primarily mothers). The results documented acceptability and feasibility as well as significant improvements in quality of life, parenting behaviors, and mealtime interactions. Two focus groups also informed future programming, with the next step being this proposed trial to demonstrate efficacy prior to conducting large multi-institutional trials.

Similar interventions for survivors of childhood cancer have had limited impact, focus almost exclusively on exercise, and exclude caregivers (the primary nutrition gatekeepers in the home). In addition, few studies have identified biological mechanisms that explain intervention effects. Our primary objective is to examine the efficacy of HOPE GROWS among 30 survivors (ages 8-12, and less than 2 years off active treatment) and their primary caregivers. Families will be randomized to participate in the intervention or an enhanced control group. Assessments for both groups will be collected at orientation (1-week prior to intervention), immediately following the intervention (week 10), and again at 4 months. Measures will include dietary and physical activity patterns, cardiometabolic indices, GI microbiome, quality of life, and family engagement and interactions.
This program is innovative as it: 1) tests a novel, theory-driven lifestyle intervention in the context of a cancer survivor garden, 2) targets both youth survivors and caregivers (often mothers in dire need of support); 3) includes mixed methods and multiple informants; and 4) explores the mechanistic role of the GI microbiome in pediatric cancer. The information gleaned from this project will be used to inform, educate, and empower families to improve lifelong behaviors leading to improved health outcomes.

**Project Information: Impact**

The Garden of Hope is both professional and personally relevant to me. After losing a brother to cancer at age 12, my family was found to be affected by an autosomal dominant cancer-prevalence mutation known as Li-Fraumeni Syndrome (LFS). This shocking revelation prompted my return to OSU, where I focused my doctoral studies on gene-environment interactions related to cancer risk. I remain committed to conduct meaningful research to fill the colossal gap in the literature pertaining to lifestyle interventions that may reduce the risk of cancer-related comorbidities and improve the quality of life for survivors and their families.

As a 2-time Buckeye alumni and current faculty member, I am keenly aware of the reputation and impact of OSU's scholarship, education, and service globally. As a leading land-grant university, OSU sets the bar for the creation and dissemination of knowledge to our communities, state, nation, and planet. HOPE GROWS represents the best of a land-grant university, literally - from crop to community.

In addition, this projects highly focused, integrated, and transformational framework aligns beautifully with the mission and vision of Women & Philanthropy. This family-centered program, unlike any other in the country, is designed to inspire and empower youth and their caregivers to become agents of change and create a sustained culture of health.

**Links & Additional Resources**

http://spees11.wixsite.com/hope
https://www.facebook.com/osu/videos/10156719720583858/

**Project Budget**

<table>
<thead>
<tr>
<th>Proposal Expense Items</th>
<th>Funding Requested from Women &amp; Philanthropy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salaries and Wages</td>
<td>$30,000</td>
</tr>
<tr>
<td>2. Production Materials</td>
<td></td>
</tr>
<tr>
<td>3. Equipment</td>
<td></td>
</tr>
<tr>
<td>4. Software</td>
<td></td>
</tr>
<tr>
<td>5. Fabrication</td>
<td></td>
</tr>
<tr>
<td>6. Project Evaluation</td>
<td></td>
</tr>
<tr>
<td>7. Promotion/Publicity</td>
<td></td>
</tr>
<tr>
<td>8. Other Expenses:</td>
<td></td>
</tr>
<tr>
<td>- Supplies</td>
<td>$10,500</td>
</tr>
<tr>
<td>- Other/Miscellaneous</td>
<td>$9,500</td>
</tr>
<tr>
<td>Total</td>
<td>$50,000</td>
</tr>
</tbody>
</table>

THE OHIO STATE UNIVERSITY
This novel study is designed to improve the quality of life and long-term health outcomes of survivors of youth cancer and their families. This innovative, theory-driven and evidence-based behavioral intervention aligns well within the transformational work supported by Women & Philanthropy at The Ohio State University.

SALARY AND WAGES ($30,000 Total):
1) Joseph Rausch, PhD ($2,000). As a quantitative psychologist, Dr. Rausch has extensive experience in research methodology and biostatistics, and has worked closely with our research team on previous pediatric and family intervention studies. Dr. Rausch will assume primary responsibility for management of data entry and verification, feedback and queries with research staff, design and testing of registration processes, data entry procedures, data analysis, and dissemination of study results.

2) Research Assistant (25%, $14,000). A trained RA will be responsible for the day-to-day management of the research effort. This includes preparing study materials and protocol manuals, recruitment and scheduling and coordinating family assessments, assisting with data collection and basic analysis.

3) Doctoral Student (25%, $14,000). Ashlea Braun, MS, RDN, LD is a Registered Dietitian Nutritionist extensively trained and currently serving as our remote motivational interviewing health coach for our garden studies. Ashlea will continue to work closely with our motivational interviewing (MI) consultant to ensure she meets competencies and study fidelity throughout the study. She will also assist the study RA with all research efforts.

OTHER EXPENSES ($20,000 Total): SUPPLIES ($10,500):
1) Harvesting supplies ($1,000) to cover garden gloves, harvest bags, hand tools, sunscreen, and water bottles;
2) Microbiome kits and postage ($3,500);
3) Cooking demos supplies ($500) including paper products, plastic utensils, napkins, cups, cutting board, knives, and ingredients for 10 demos;
4) Farm/Garden ($5,500) to cover garden plot preparation, greenhouse rental, land, labor, fertilizer, seed, etc).

MISCELLANEOUS EXPENSES ($9,500): 1) GI Microbiome ($8,000) expenses to cover processing, storage, and analysis of microbiome; 2) Participant Incentives ($1,500) for clinic visits at 3 time point.