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Tools for Healthy Living: Lessons Learned About Program Efficacy, Youth Knowledge, and Youth Engagement

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Cover Page Footnote

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Tools for Healthy Living: Lessons Learned about Program Efficacy, Youth Knowledge, and Youth Engagement

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Abstract. Youth in grades 4 to 6 were presented with healthy living topics through a two cycle, 11-week 4-H after school curriculum designed for low income, urban populations. Pre- and post-surveys were used to measure knowledge of healthy homes topics such as mold and moisture, lead poisoning, pests, asthma triggers, smoking, and food safety. Daily journaling activities designed to measure youth engagement also added to the mixed data set. Lessons learned about program efficacy, youth knowledge, and youth engagement are presented.

INTRODUCTION AND BACKGROUND

In 2009, the U.S. Surgeon General called for action to promote healthy homes, citing that millions of people suffer from ailments linked to their home environments (U.S. Department of Health and Human Services, 2009). This report identifies home hazards as: lead poisoning, poor indoor air quality, environmental tobacco smoke, burn and fall hazards, improperly stored household chemicals, and pesticide exposure (U.S. Department of Health and Human Services, 2009). Unfortunately, home health hazards disproportionately affect low income and urban communities, and exposure to substandard housing is not evenly distributed across populations. Black and low-income persons are 1.7 times and 2.2 times more likely, respectively, to live in housing with severe health hazards compared with the general population (Krieger & Higgins, 2002).

The State Department of Public Health found that children age 6 or younger were negatively affected by living in homes with damaged or peeling paint due to lead exposure. Symptoms of poisoning in children include restlessness, irritability, decreased IQ, learning disabilities, behavioral issues, and—in acute cases—coma or death. The health of youth and adults was also threatened by hazards related to mold growth, allergen issues, evidence of pests, and clutter. Asthma is a chronic respiratory disease that is characterized by symptoms of wheezing, coughing, and shortness of breath. A number of conditions within the home can trigger or exacerbate asthma symptoms. Exposure to pets, dust mites, cockroaches, rodents, pesticides, and molds, as well as

environmental tobacco smoke can worsen asthma symptoms (Davilla & Veneziano, 2017).

In response, Bothell et al. (2014) designed an 11-week 4-H afterschool curriculum entitled “Tools for Healthy Living” for low income, urban populations (Table 1). Bothell et al. (2017) developed the curriculum because there was no curriculum on healthy homes geared toward urban youth. This curriculum was implemented at multiple sites and established as 4-H clubs and participating youth were enrolled as 4-H members.

Program Cycle 1 (Lessons 1–5) includes lessons on lead, asthma, mold, and pests. Program Cycle 2 (Lessons 6–11) includes lessons on smoking, clutter, food safety, and empowerment. This article addresses the effectiveness of the “Tools for Healthy Living” program as well as lessons learned from the evaluation of this program. While the curriculum was developed in 2013 and the first set of data was gathered in 2014, this article specifically is presenting Year 5 data. To determine the effectiveness of the curricular intervention, we developed an evaluation protocol linked to programmatic goals for the “Tools for Healthy Living” program. The two primary evaluation questions follow:

1. Did youth knowledge of healthy homes topics increase as a result of the program?
2. Were youth engaged (cognitively, behaviorally, and/or emotionally) in healthy home topical areas as a result of the program?

These evaluation questions were critical to this curriculum project. While there is much known about effectively

evaluating youth knowledge, practitioners still struggle with low response rates and comprehensive evaluation of program impact, especially in urban, low-income areas and in afterschool settings (Apsler, 2009). In general, surveying low-income populations can pose challenges. Limiting factors include transience, English as a second language, scheduling and/or timing, and suspicion toward strangers (Weiss & Bailar, 2001). Additionally, in many schools, particularly those serving low-income youth, survey protocols may miss significant portions of the student sample due to absenteeism (Weitzman et al., 2003). This project addresses these issues by strong communication with afterschool partners, having consistent teachers deliver the evaluation, developing trust with youth, and conducting the program during the academic year. This study has broader implications for Extension professionals who are developing innovative programming and obtaining sound evaluation data from youth in urban community settings.

DATA COLLECTION

To respond to this inquiry, we collected qualitative and quantitative data at four 4-H program sites. The state university institutional review board (IRB) granted approval for the research with a waiver of signed parental consent. As such, evaluators provided parents/guardians with printed materials describing data collection procedures.

We selected sites using a convenience sampling approach based on youth populations where more than 50% were eligible for free or reduced-price lunch. These program participants matched the demographics of the organization/school populations.

Afterschool partners from community organizations and school districts identified and recruited urban youth in Grades 4–6. Youth enrolled in the program at any of the sites were eligible for this study and were enrolled in site specific community 4-H clubs led by the program instructors. In total, 82 youth in Grades 4–6 participated in an 11-week program at four afterschool locations during the school year. Of the 82

participants, 50 youth completed both pre- and post-Cycle 1 quantitative quiz assessments, resulting in a 61% response rate. Sample items from one of the assessments follow.

Answer true/false for this question: Although cigarette smoke and second-hand smoke are harmful, the chemicals that cigarette smoke leaves on clothes and furniture are not harmful.

In addition, 40 youth completed both pre- and post-Cycle 2 quantitative quiz assessments, resulting in a 49% response rate during Cycle 2. Further, at the end of each curriculum session, youth were asked to complete a journaling exercise by writing about what they learned, how they felt, or what they will do as a result of the lesson. A total of 57 journals were collected across the four sites, resulting in 70% response rate. Sample journal prompts included: Since our previous lesson, have you done anything to make your home healthier?

DATA ANALYSIS

A paired samples *t*-test was conducted in SPSS comparing pre- and post-test results for each program cycle. For the qualitative analysis, program assistants typed handwritten text that was forwarded to the evaluator for further analysis. The text was uploaded into NVivo, and text analysis tools were used to code the data into cognitive, emotional, and behavioral responses. The coding scheme used reflects these three dimensions of youth engagement characterized by their respective indicators (Fredricks et al., 2004).

FINDINGS

The data collected from pre- and post-evaluations from Cycle 1 (Lessons 1–5) and Cycle 2 (Lessons 6–11) indicate that the gain in knowledge was not consistent across the cycles. These results suggest that youth knowledge increased significantly (significance was set at 0.05) following implementation of the Cycle 1 curriculum. However, youth scored lower on the Cycle 2 post-assessment, indicating that knowledge was gained, but not at a level of significance.

Qualitative responses from 11 weekly journal entries in addition to one final entry were divided into three themes: cognitive, behavioral, and emotional. Journal entries 1–5 occurred during Cycle 1, and the others were written during Cycle 2. Qualitative findings show (Table 3) that youth had mostly cognitive themes (170 items), though substantial behavioral themes were also reported (92 items). Additionally, youth also referenced emotional themes as a result of the program (8 items). These themes were pre-selected prior to analysis. The journal entry number corresponds to each week and theme in the program with the 12th entry for after-program reflection.

Table 1. Demographics of Youth Participants

Demographic	Percentage (%) of Participants
Gender	
Female	56%
Male	44%
Ethnicity	
African American	43%
Hispanic	29%
Asian	5%
White	23%

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Table 2. Pre-/Post-test Results Cycle 1 and Cycle 2

		Pre-/post-test (n = 50)	Pre-/post-test (n = 40)
Mean	Pre	72.00	77.33
	Post	86.80	82.38
	N	50	40
	Mean difference	-14.80	-5.05
	SD	30.86	33.35
95% Confidence interval	Lower	-23.46	-12.20
	Upper	-6.14	2.10
	T	-3.45	-1.43
	df	49	39
	Significance (two-tailed)	0.001*	0.161

Cognitive engagement stresses investment in learning; it includes a willingness to exert the effort necessary to comprehend complex ideas and master difficult skills. Behavioral themes concern participation in learning and academic tasks and include behaviors such as effort, persistence, concentration, attention, and contributing to class discussions. Emotional themes refer to a student's affective reactions, including interest, boredom, happiness, sadness, and anxiety (Fredricks et al., 2004). Examples of students' journal comments classified as cognitive, behavioral, and emotional themes follow:

- Cognitive themes:
 - “I learned that five grains of salt are equal to the amount of lead that can make you sick. I also learned that it is in paint, imported toys, and medicines/cosmetics.” 5th grader
- Behavioral themes:
 - “I learned that mold can be on walls and in food if it sits for a long time. Mold stinks and sometimes it can get you sick. I won't eat moldy food from now on.” 6th grader

- Emotional themes:
 - “I learned that asthma is serious business and not to be played with and you can still play sports. Asthma makes it hard to breathe. I am happy I can still play sports.” 6th grader

The quantitative and qualitative data that resulted from youth participating in an afterschool program focused on the importance of healthy homes provide preliminary evaluation evidence of the efficacy of addressing this important topic. Youth who participated in the program had multiple opportunities to document their knowledge and understandings as well describe their reflections after each lesson.

LIMITATIONS

We would like to note a few limitations to this study. First, our sample size was limited to 50 and 40 matched pair sets for the quantitative data we collected, thus limiting the statistical power of our findings. Furthermore, the qualitative data provide a deeper understanding of what youth learned and how they were engaged through the program. However, the journal exercises were not always completed during the weekly

Table 3. Journal Results Classified by Cognitive, Behavioral, and Emotional Themes (n = 57)

	Journal Entry Number												Total number of measurements
	1	2	3	4	5	6	7	8	9	10	11	12	
Cognitive theme	27	28	25	16	2	6	18	25	15	0	1	7	170
Behavioral theme	8	19	13	12	2	5	10	10	6	3	1	3	92
Emotional theme	1	1	5	1	0	0	0	0	0	0	0	0	8

sessions at all four locations, resulting in limited data. Also, the prompts given to youth may have varied or the questions themselves may have influenced the type of response. Lastly, youth understanding of the journals as assessment tools may have biased their responses.

DISCUSSION AND CONCLUSIONS

As the literature reflects, the “Tools for Healthy Living” team faced a variety of challenges impacting their ability to conduct a robust evaluation. Short intervention time periods, lack of enthusiasm for evaluation by field staff educators, afterschool schedule changes due to winter weather cancellations, and lack of capacity to effectively collect and analyze different sources of evaluation data all affected the program’s evaluation efforts in prior years.

Over time, however, the grant team learned a number of lessons about how to overcome these barriers to attain success in evaluating this educational intervention. First, implementing a mixed methods approach and incorporating more qualitative data supported the ability of the team to be effective in the evaluation process. As indicated by Greene (2005), using a mixed methods approach allows for a deeper understanding of how well the program did in reaching its educational and engagement goals. Second, leaders also discovered the importance of establishing a culture of evaluation in an urban 4-H afterschool program. Creating an organizational culture that values evaluation data is important, but it can be difficult (Mayne, 2008; Scheerens, 2004).

The grant team discovered through this experience that it can be even more challenging to build a culture of evaluation in settings where literacy is low, and general exposure to evaluation is limited. Evaluation instruments were not aligned to individual participants’ literacy levels or native languages. Embedding evaluation into the curriculum was a way to further build the evaluation culture, and it also ensured that evaluation was completed properly and in a timely way. Lastly, having strong relationships with afterschool sites and site coordinators from the partnering organizations was imperative for collecting good evaluation data. It is well known that maintaining strong relationships is crucial to successful implementation of afterschool youth development programming (Little et al., 2008). For the team, maintaining strong relationships with afterschool sites and their host/partnering organizations was critical to achieving program and evaluation success.

Recognizing and navigating the challenges of gathering evaluation data in urban afterschool settings, the team was able to achieve an effective evaluation approach that fits well in this environment (Webster, 2016). The team was able to overcome challenges posed in evaluating low-income, urban youth populations in 4-H afterschool settings by being reflective, focusing on the development of an evaluation culture

into program implementation, and effectively managing relationships with youth partnering organizations, site coordinators, program instructors, and evaluators. Formative evaluation efforts have been proven as effective means for Extension educators to determine the changes needed to improve programs over time (Jayaratne, 2016).

The quantitative data collected through this effort show that this program was successful in reaching the goal of increasing youth knowledge of healthy homes topics. The significant increase ($p = 0.001$) in Cycle 1 and the small increase in Cycle 2 demonstrate that increases in knowledge were achieved. Interesting to note is that the increase was higher during the first cycle. Upon consideration, this may be a result of foundational knowledge presented during the initial lessons and question content, which allowed for better performance on the pre-test of Cycle 2.

The qualitative data collected through the journal activity provided insight into the broad cognitive, behavioral, and emotional engagement goals of the program. In the journal responses, youth focused mostly on cognitive results, especially the substantive information they learned. They also reported a variety of behavioral responses, in the forms of behavioral intention statements or general observations about their own behavior. Lastly, though few youths mentioned emotional engagement elements in their journal responses, it is important to note that some youth did attend to these factors and made emotional connections with the program content.

In the end, this program reached the basic educational and engagement goals it set out to achieve. Further research about youth interests and needs related to healthy homes topics would provide more insight on how to improve future programming. A deeper investigation into how youth use or translate what they learned in the program to their home lives outside of school would also improve future evaluative efforts of healthy homes interventions.

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