

Growing Healthy Kids: A School Enrichment Nutrition Education Program to Promote Healthy Behaviors for Children

Abstract

The Growing Healthy Kids Program is a school-based nutrition education program that teaches students in Kindergarten through 2nd grade about healthy eating, physical activity, and how their body uses food. Pre- and post-knowledge data is collected from the students to measure changes in nutrition knowledge. In the first 2 years of the program, significant improvements in nutrition knowledge were found in all three grades. Teachers reported that students were more aware of the importance of nutrition and were making healthier meal and/or snack choices at the end of the program.

Alyssa Vierregger
Extension Educator
University of
Nebraska-Lincoln
Extension
Lincoln, Nebraska
avierregger2@unl.edu

Johnna Hall
Extension Educator
University of
Nebraska-Lincoln
Extension
Lincoln, Nebraska
jhall21@unl.edu

Natalie Sehi
Extension Educator
University of
Nebraska-Lincoln
Extension
Lincoln, Nebraska
nsehi2@unl.edu

Mary Abbott
Extension Associate
University of
Nebraska-Lincoln
Extension in
Lancaster County
Lincoln, Nebraska
mabbott3@unl.edu

Karen Wobig
Extension Educator
University of
Nebraska-Lincoln
Extension in
Lancaster County
Lincoln, Nebraska
kwobig2@unl.edu

Julie A. Albrecht
Extension Food
Specialist, Professor
University of
Nebraska-Lincoln
Extension
Lincoln, Nebraska
jalbrecht1@unl.edu

Mindy Anderson-Knott
Director of Evaluation
and Development
University of
Nebraska-Lincoln
Lincoln, Nebraska
mandersonknott2@unl.edu

Wanda Koszewski
Associate Professor,
Chair of Nutrition &
Dietetics
University of North
Dakota
Grand Forks, North
Dakota
wanda.koszewski@und.edu

Introduction

Childhood obesity rates have more than doubled in the United States over the last 30 years (CDC, 2013). The "F as in Fat" report (Robert Wood Johnson Foundation, 2009) recognizes the important role schools play in the lives of our nation's families and highlights the critical need for schools to improve their nutrition- and health-related programs. Teaching children the importance of eating healthy and being physically active encourages them to develop and maintain healthy habits throughout their lives.

Physical activity levels and eating behaviors are influenced by environmental factors, including families,

community organizations, health care providers, faith-based institutions, businesses, government agencies, the media, and schools (Wechsler, McKenna, Lee, & Dietz, 2004). Well-designed and implemented school programs have potential to promote healthy eating, physical activity, and reduced sedentary time. Also, academic performance may be associated with good nutrition, physical activity, physical education, and nutrition programs (Wechsler et al., 2004). CDC has recommended that schools "implement health education that provides students with the knowledge, attitudes, skills and experiences needed for lifelong healthy eating and physical activity" (Guideline 5) (CDC 2011). Nutrition interventions based on promoting behavior change have proven effective in changing dietary behaviors among children. School-based nutrition interventions have potential to positively affect youth. To be successful, nutrition education programs require a systematic approach that combines knowledge of determinants of behavior with effective strategies and an evaluation plan (Hoelscher, Evan, Pacel, & Kelder, 2002). The objectives of the Growing Healthy Kids through Healthy Communities school enrichment kits (GHK-SEK) program were to improve teacher and student nutrition knowledge and to potentially change their attitudes and behaviors.

Development of the Program

The Growing Healthy Kids through Healthy Communities school enrichment kits (GHK-SEK) were developed by SNAP-Ed Extension educators/assistants and adapted for the GHK-SEK program. The objective was to reach all K-2 grade students with nutrition education to enhance the health curriculum. The GHK-SEK strategy engages teachers to provide direct education through easy-to-use nutrition kits. The kits contain five lessons plus an optional lesson for each of the K-2 grades (Tables 1, 2, and 3). The lessons are based on the Social Cognitive Theory (SCT), which emphasizes the role of reinforcement in changing behavior (McKenzie, Neiger, & Thackerary, 2013; Bandura, 2001). For example, in the first grade school enrichment kits, direct reinforcement is used when students receive a special stamp for participating and answering questions correctly during the nutrition lessons. Each lesson meets at least one health standard for Lincoln Public Schools (LPS) and/or the National Health Standards (UNL EdMedia, 2013; CDC, 2013). Tables 1, 2, and 3 provide the learning objective, main topic, SCT constructs, and national standards for each lesson within the curriculum for each grade. Nutrition experts (n=3) reviewed all lessons for accuracy of information and a curriculum specialist reviewed the lessons for age appropriateness and aligning with the National Health Standards. Lessons were revised accordingly. All resources for each lesson are included in the kit.

The kits allow teachers with limited nutrition training to provide accurate and current nutrition information and increase the amount of classroom time spent on health and nutrition. Summer training workshops were held for K-2 teachers. Objectives of the first training were to 1) introduce the teachers to the curriculum, 2) educate them on basic nutrition concepts, and 3) demonstrate how to teach nutrition utilizing the kits. Three 4 hour workshops were conducted; one for each grade level. Workshops allowed the teachers to learn about the lessons and activities included in each kit and how to implement the lessons in their classroom. Pre post-test evaluations were conducted which included knowledge and self-efficacy questions after each workshop and teachers received an evaluation after they implemented the curriculum. In subsequent summer workshops, teachers were educated on the new school lunch guidelines, ways to incorporate physical activity into the classroom, and additional nutrition education resources available to them. Statistical analysis (t-test) was conducted between

those who attended the workshop and those who did not. IRB approval was obtained from the University of Nebraska-Lincoln and the LPS system.

The school enrichment program started with 12 LPS Title I elementary schools, and in 2009 the program expanded to all Title 1 and non-title K-2 grade classrooms in LPS (n=39 schools).

Table 1.

Kindergarten Lessons, Objectives, Activities, SCT Constructs, & National Health Education Standards

Lesson Topic & Time	Learning Objectives	Activities	SCT Constructs	National Standards
<p>Introduction (Extension Educator: One, 30-minute activity)</p>	<ul style="list-style-type: none"> Identify the importance of hand washing & when it should be performed Demonstrate proper hand washing 	<ul style="list-style-type: none"> GloGerm Hand Washing Activity Administer Pre-test 	<ul style="list-style-type: none"> Outcome expectations (benefits of hand washing) Self-efficacy Facilitation (knowledge) 	<ul style="list-style-type: none"> NHES 7: Demonstrate healthy practices & behaviors that maintain or improve personal health.
<p>1: Food Guide Adventures (Teacher: Three, 20-minute activities & one 5-minute activity)</p>	<ul style="list-style-type: none"> To explain why food is important to good health To name the 5 basic food groups that keep the body healthy 	<ul style="list-style-type: none"> MyPlate Activity Mat Where does my food go? I know an old lady "The Food Groupie Adventures" DVD 	<ul style="list-style-type: none"> Behavioral Capacity (knowledge, poster, handouts) Social Support (parent letters) Self-efficacy Collective-efficacy Observational learning (Food Groupie characters) Outcome 	<ul style="list-style-type: none"> NHES 1: Identify that healthy behaviors affect personal health. NHES 7

			expectations (benefits of each food group)	
<p>2: Fun Food Groups (Teacher: Five, 20-minute activities)</p>	<ul style="list-style-type: none"> To name 5 basic food groups that keep the body healthy Name examples of physical activities Explain how regular physical activity contributes to good health 	<ul style="list-style-type: none"> Go with Grains Vegetable Variety Fun with Fruit Dairy Powerful Protein 	<ul style="list-style-type: none"> Behavioral Capacity (knowledge) Self-efficacy Outcome expectations (benefits) 	<ul style="list-style-type: none"> NHES 1 NHES 7
<p>3: Mealtime Matters (Teacher: Three, 20-minute activities)</p>	<ul style="list-style-type: none"> Show ways to make breakfast part of the daily morning routine Describe healthful meals and snacks Identify the importance of hand washing Identify benefits of hand washing Demonstrate hand washing 	<ul style="list-style-type: none"> Keep them clean Begin with breakfast Cook it! 	<ul style="list-style-type: none"> Behavioral Capacity (knowledge and poster) Self-efficacy Outcome expectations (benefits) Collective-efficacy 	<ul style="list-style-type: none"> NHES 1 NHES 2: Identify how the family influences personal health practices & behaviors NHES 7
<p>4: Healthy Habits (Teacher: Three, 20-minute activities)</p>	<ul style="list-style-type: none"> Describe healthful meals and snacks 	<ul style="list-style-type: none"> A sticky experiment MyPlate 	<ul style="list-style-type: none"> Behavioral Capacity (knowledge) 	<ul style="list-style-type: none"> NHES 1 NHES 7

	<ul style="list-style-type: none"> • Make decisions about healthful food choices (avoiding fatty foods) 	<ul style="list-style-type: none"> • Sandwich • Fun Foods bingo game 	<ul style="list-style-type: none"> • Outcome expectations (negative and positive) • Self-regulation (providing feedback) • Self-efficacy 	
<p>5: Fantastic Five Senses (Teacher: Three, 20-minute activities)</p>	<ul style="list-style-type: none"> • Name the five senses • Associate sensory organs with senses 	<ul style="list-style-type: none"> • Sounds and Smells • Taste and Touch • Colors 	<ul style="list-style-type: none"> • Behavioral Capacity (knowledge) • Self-efficacy 	<ul style="list-style-type: none"> • NHES 1: Recognize that there are multiple dimensions of health
<p>Optional Lesson (Teacher: Two, 20-minute activities)</p>	<ul style="list-style-type: none"> • Make decisions about healthful food choices • Identify importance of hand washing 	<ul style="list-style-type: none"> • Seed Planting • Find the Germs 	<ul style="list-style-type: none"> • Observational learning (seed planting) • Collective-efficacy 	<ul style="list-style-type: none"> • NHES: Describe ways to prevent communicable diseases. • NHES 7
<p>Final Lesson: Snack/Physical Activity (Extension Educator: One, 30-minute activity)</p>	<ul style="list-style-type: none"> • To name the 5 basic food groups that keep the body healthy • Describe healthful meals and snacks • Make decisions about healthful food choices • Explain how 	<ul style="list-style-type: none"> • Make a healthy snack (Pudding Cup) • Physical Activity game • Administer Post-test 	<ul style="list-style-type: none"> • Outcome expectations • Self-efficacy • Observational learning 	<ul style="list-style-type: none"> • NHES 1 • NHES 7

	regular physical activity contributes to good health		
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Table 2.

First Grade Lessons, Objectives, Activities, SCT Constructs, & National Health Education Standards

Lesson Topic & Time	Learning Objectives	Activities	SCT Constructs	National Standards
Introduction (Extension Educator: One, 30-minute activity)	<ul style="list-style-type: none"> Identify the importance of hand washing & when it should be performed Demonstrate proper hand washing 	<ul style="list-style-type: none"> GloGerm Hand Washing Activity Administer Pre-test 	<ul style="list-style-type: none"> Outcome expectations (benefits of hand washing) Self-efficacy Facilitation (knowledge) 	<ul style="list-style-type: none"> NHES 7: Demonstrate healthy practices & behaviors that maintain or improve personal health.
1: Food and Your Body, Part 1, Why My Body Needs Food (Teacher: Three, 20-minute activities)	<ul style="list-style-type: none"> List reasons why the body needs food Identify the benefits that healthful snacks provide for the body 	<ul style="list-style-type: none"> Book: "Berenstain Bears and Too Much Junk Food" 	<ul style="list-style-type: none"> Behavioral Capacity (knowledge) Outcome expectations (benefits) Self-efficacy Self-regulation (feedback) Observational learning (through Berenstain Bears characters) 	<ul style="list-style-type: none"> NHES 1 NHES 2 NHES 7

<p>2: Food and Your Body, Part 2, How My Body Uses Food (Teacher: Three, 20-minute activities)</p>	<ul style="list-style-type: none"> Name parts of the body that are used to eat and digest food Identify the benefits that healthful snacks provide for the body 	<ul style="list-style-type: none"> What's inside me apron What's inside me t-shirt 	<ul style="list-style-type: none"> Behavioral Capacity (knowledge) Self-efficacy 	<ul style="list-style-type: none"> NHES 1
<p>3: The 5 Food Groups (Teacher: Three, 20-minute activities)</p>	<ul style="list-style-type: none"> Name foods in the five basic food groups and foods in the "other foods" category Choose and record a favorite healthful food from each of the five food groups 	<ul style="list-style-type: none"> MyPlate group lesson MyPlate Discovery MyPlate Puppets Food group booklet 	<ul style="list-style-type: none"> Observational learning (Mr. Chef) Behavioral Capacity (knowledge) Social support (parent newsletter) Self-efficacy Outcome expectations (benefits) Collective-efficacy 	<ul style="list-style-type: none"> NHES 1 NHES 7
<p>4: What is a Balanced Meal? (Teacher: Three, 20-minute activities)</p>	<ul style="list-style-type: none"> Define the term "healthful meals" Plan a balanced breakfast 	<ul style="list-style-type: none"> Group Lesson, Meal planning/Healthy Breakfast Apple Pocket Wall Chart A Healthy meal on MyPlate 	<ul style="list-style-type: none"> Behavioral Capacity (knowledge) Self-regulation (feedback) Collective-efficacy 	<ul style="list-style-type: none"> NHES 1 NHES 5: Identify situations when a health-related decision is needed

			<ul style="list-style-type: none"> • Self-efficacy 	<ul style="list-style-type: none"> • NHES 7
<p>5: Healthy Snacking (Teacher: Three, 20-minute activities)</p>	<ul style="list-style-type: none"> • Identify the benefits that healthful snacks provide for the body 	<ul style="list-style-type: none"> • Group Lesson, healthful snacks • Apple pocket wall chart • Healthy snacks activity sheet 	<ul style="list-style-type: none"> • Behavioral Capacity (knowledge) • Outcome expectations (benefits) • Self-efficacy 	<ul style="list-style-type: none"> • NHES 1 • NHES 7
<p>Optional Lesson (Teacher: Five, 10-minute activities)</p>	<ul style="list-style-type: none"> • Identify healthful foods and snacks • Identify the benefits of dairy products 	<ul style="list-style-type: none"> • Foods from A to Z Poster • Fun with Fruits & Vegetables Worksheet • Eat Healthy Foods Worksheet • Germs Get Around Booklet • "MOO 2 YOU" Video 	<ul style="list-style-type: none"> • Outcome expectations • Observational Learning • Facilitation 	<ul style="list-style-type: none"> • NHES 1
<p>Final Lesson: Snack/Physical Activity (Extension Educator: One, 30-minute activity)</p>	<ul style="list-style-type: none"> • To name the 5 basic food groups that keep the body healthy • Describe healthful meals and snacks • Make decisions about healthful food choices 	<ul style="list-style-type: none"> • Make a healthy snack (Trail Mix) • Physical Activity game • Administer Post-test 	<ul style="list-style-type: none"> • Outcome expectations • Self-efficacy • Observational learning 	<ul style="list-style-type: none"> • NHES 1 • NHES 7

	<ul style="list-style-type: none"> • Explain how regular physical activity contributes to good health 			
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Table 3.

Second Grade Lessons, Objectives, Activities, SCT Constructs, & National Health Education Standards

Lesson Title & Time	Learning Objective	Main topics in each Lesson	SCT Constructs	National Standards
Introduction (Extension Educator: One, 30-minute activity)	<ul style="list-style-type: none"> • Identify the importance of hand washing & when it should be performed • Demonstrate proper hand washing 	<ul style="list-style-type: none"> • GloGerm Hand Washing Activity • Administer Pre-test 	<ul style="list-style-type: none"> • Outcome expectations (benefits of hand washing) • Self-efficacy • Facilitation (knowledge) 	<ul style="list-style-type: none"> • NHES 7: Demonstrate healthy practices & behaviors that maintain or improve personal health.
1: A Healthy Lifestyle (Teacher: Two, 40-minute activities)	<ul style="list-style-type: none"> • Illustrate behaviors that promote good health • Trace the digestive process 	<ul style="list-style-type: none"> • Physical Activity • "Sometimes" foods • Digestion Question 	<ul style="list-style-type: none"> • Behavioral Capacity (knowledge) • Observational learning (through "The King") • Self-efficacy 	<ul style="list-style-type: none"> • NHES 1 • NHES 7
2: MyPlate (Teacher: Two, 40-minute activities)	<ul style="list-style-type: none"> • Name the five food groups and foods from each section of the MyPlate • Identify foods 	<ul style="list-style-type: none"> • Introduction to MyPlate • Food Heads • MyPlate Puzzle 	<ul style="list-style-type: none"> • Behavioral Capacity (MyPlate poster in classroom and handout, knowledge) 	<ul style="list-style-type: none"> • NHES 1 • NHES 5

	that include more than one food group	<ul style="list-style-type: none"> • Food Ball Toss 	<ul style="list-style-type: none"> • Self-efficacy 	
3: Plan for Health (Teacher: Two, 40-minute activities)	<ul style="list-style-type: none"> • Demonstrate how to choose healthful food versus unhealthful foods • Develop a day's menu that contains a variety of foods from MyPlate 	<ul style="list-style-type: none"> • Snack Smart Game • Menu Planner 	<ul style="list-style-type: none"> • Behavioral Capacity (knowledge) • Outcome expectations (benefits) • Self-efficacy • Collective-efficacy 	<ul style="list-style-type: none"> • NHES 7 • NHES 8: Make requests to promote personal health
4: Food Variety (Teacher: Two, 30-minute activities)	<ul style="list-style-type: none"> • Explain why balanced meals are important • Name the five food groups and food from each section of the MyPlate 	<ul style="list-style-type: none"> • Nutrition SpinZone Game • F&V Bingo 	<ul style="list-style-type: none"> • Self-efficacy • Collective-efficacy • Self-regulation (through feedback) • Observational learning (through peers) 	<ul style="list-style-type: none"> • NHES 1 • NHES 5
5: Making Choices (Teacher: Two, 40-minute activities)	<ul style="list-style-type: none"> • Describe healthful meals and snacks • Make decision about healthful 	<ul style="list-style-type: none"> • Find the fat experiment • MyPlate Go Fish/ Concentration 	<ul style="list-style-type: none"> • Behavioral Capacity (knowledge and environment) • Outcome expectations 	<ul style="list-style-type: none"> • NHES 5 • NHES 7

	<ul style="list-style-type: none"> • food choices 		<p>(benefits and negatives)</p> <ul style="list-style-type: none"> • Self-efficacy 	
<p>Optional Lesson (Teacher: One, 30-minute, & One, 10-minute activities)</p>	<ul style="list-style-type: none"> • Describe healthy eating concepts • Describe healthful meals and snacks • Identify foods in each food group 	<ul style="list-style-type: none"> • Apple Writing Worksheet • Eat Smart with MyPlate worksheet 	<ul style="list-style-type: none"> • Outcome expectations • Self-efficacy • Facilitation 	<ul style="list-style-type: none"> • NHES 1 • NHES 5
<p>Final Lesson: Snack/Physical Activity (Extension Educator: One, 30-minute activity)</p>	<ul style="list-style-type: none"> • To name the 5 basic food groups that keep the body healthy • Describe healthful meals and snacks • Make decisions about healthful food choices • Explain how regular physical activity contributes to good health 	<ul style="list-style-type: none"> • Make a healthy snack ("Cheese Creature": Cheese stick, pretzels, raisins) • Physical Activity game • Administer Post-test 	<ul style="list-style-type: none"> • Outcome expectations • Self-efficacy • Observational learning 	<ul style="list-style-type: none"> • NHES 1 • NHES 7

Year 1	89.8%	94.4%	4.6%**	95.6%	96.9%	1.3%*	51.5%	63.9%	12.4%**
Year 2	90.2%	93.6%	3.4%***	96.2%	97.7%	1.5%**	58.9%	81.4%	22.5%***
*p 0.05, **p 0.01, ***p 0.001 (two-tailed)									

Teachers completed a Classroom Data form after the 3-week session, including demographic information on students, how much time they spent teaching the GHK curriculum, and lessons used. After using the kits, teachers were emailed a follow-up survey to report on their experience. The survey included their own self-reported health changes; teacher reported student preferences to curriculum activities and efficacy, and outcome expectations. Eighty percent of teachers taught five lessons provided in the GHK curriculum. Most (87%) of the teachers (n =72) who responded (62.5% response rate) to the survey reported they were "more confident in teaching nutrition," and 80% of respondents reported that they "have become more aware of nutrition." Over half of the teacher respondents reported increased physical activity, improved hand washing, and healthier meal and/or snack choices after teaching the curriculum to their students (n= 140) (Hall et al., 2013). Two confidence scales were created for "efficacy expectations" (13 questions) and "outcome expectations" (6 questions) (scale: 1=not at all confident to 4=very confident). The outcome expectations did not have a significant difference between those who attended or did not attend the teacher workshop; however, the efficacy expectations score was significantly higher ($p < 0.1$) for those who attended the workshop.

The most notable change teachers observed in their students was an increased awareness of nutrition. While there was some variation among all three grades, more than half of the teachers who responded to the survey reported students were making healthier meal and/or snack choices and have improved hand washing.

Conclusions and Future Considerations

Significant increases in students' nutrition knowledge were found among all three grades during the first 2 years of the Growing Healthy Kids program. Teachers reported improved confidence in teaching nutrition and increased awareness of nutrition. Teachers also reported that students had an increased awareness of nutrition, were making healthier meal and snack choices, and improved hand washing. Sustainability of the program in the LPS district will be explored with stakeholders. Plans are currently in progress to develop a GHK-SEK handbook for national distribution.

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