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# **The Efficacy of KidQuest: A Nutrition and Physical Activity Curriculum for 5th and 6th Grade Youth**

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**Abstract:** KidQuest is a nutrition and physical activity curriculum for 5th to 6th grade youth engaging participants in goal setting, self-monitoring, and reinforcement. Evaluation of the program over the 2005-2006 school year involved a nonrandom sample of 98 intervention and 38 control group participants in rural South Dakota using baseline and ending surveys. Self-reported improvements in breakfast frequency, dairy intake, increased frequency of looking at the food label, and increased food label knowledge were observed in the intervention group, with no significant change in the control group.

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## **Introduction**

The prevalence of overweight youth ages 6-11 has more than doubled in the past 20 years, and for adolescents ages 12-19, overweight prevalence has more than tripled (U.S. DHHS, & CDC, 2006). Children

who are overweight are at risk of other serious health conditions, psychological problems, and teasing from other children and are at increased risk of being overweight or obese as an adult (Ritchie et al., 2001; Field, Cook, & Gillman, 2003).

The dietary choices and physical activity patterns of children and adolescents have been linked as causal factors for increases in overweight prevalence, with excess calories coming from the quantity of snacks, sweetened beverage consumption, and mega sizes when eating out (Field, Cook, & Gillman, 2003; Templeton, Marlete, & Panemangalore, 2005; Zive et al., 2002; French, Story, & Jeffery, 2001; Ludwig, Peterson, & Gortmaker, 2001). Children and adolescents are falling short of consuming recommended amounts of fruits, vegetables, fiber, and calcium, while the consumption of total fat and saturated fat exceeds recommended amounts. Breakfast consumption declines as children move into adolescence (U.S. DHHS, & CDC, 2006).

Children who eat breakfast on a consistent basis have better overall nutritional intake, improved academic performance, and better school attendance than children who frequently skipped breakfast (Rampersaud, Pereira, Girard, Adams, & Metz, 2005). Studies have shown that physical activity declines as children move into preadolescence and adolescence, contributing to the problem of overweight. Television viewing has been associated with increased sedentary patterns and overweight tendency (Andersen, Crespo, Barlett, & Cheskin, 1998). Studies have also identified that females, older adolescents, and adolescents from minority ethnic groups are more likely to experience activity declines as they age. Additional variables with the potential to affect activity levels include the youth's body mass index and their parents' support and encouragement of physical activity engagement (Sallis, Prochaska, & Taylor, 2000).

Preadolescents (age 9-12), also referred to as a "tweens," are in transition between childhood and adolescence as they begin to branch out and take on more responsibilities (CDC, 2000; Kelder, Perry, Klepp, & Lytle, 1994). Tweens also find it important to gain social acceptance and experience achievement. Adult and authority figures are respected, but are also seen as human beings with flaws, and the tween may begin to belittle or defy adult authority. The tween enjoys being part of a group and making up secret codes and games. An interest in competition is also developing (Oesterreich, 1995).

The tweens' reasoning skills are often concrete during the initial stages of early adolescence, with a progression to more formal operational thoughts when the tween can think more in abstract terms (Sturdevant & Spear, 2002). The behaviors at this stage of development are likely to influence future decisions (CDC, 2000; Kelder, Perry, Klepp, & Lytle, 1994). Studies have documented the impact that the school and community environment can have on the food, activity, and behavior choices of youth (Templeton, Marlette, Panemangalore, 2005; French, Story, & Jeffery, 2001; Cullen, Weber, & Zakeri, 2004; Wildey et al., 2000; Gorden-Larsen, McMurray, & Popkin, 2000).

Interventions that focus on promoting healthy eating and physical activity behaviors in children are essential in helping to reverse the trends of overweight and obesity. The purpose of the study reported here was to test the efficacy of the school-based KidQuest curriculum in promoting healthy eating and physical activity behaviors of preadolescents in the 5th and 6th grades.

## **Description of the Intervention**

### **Study Design**

The study was a quasi-experimental design with a baseline and ending survey to determine efficacy of the KidQuest intervention. The study design, procedure, and survey were approved by the South Dakota State University Human Subjects Review Board.

## KidQuest Program Description

KidQuest is a nutrition-based curriculum with a physical activity, goal setting and reward component designed for 5th to 6th grade youth. The theoretical models used in the development of KidQuest are primarily based on constructs from social cognitive theory (SCT), which has produced some behavioral changes as previously documented (Baranowski, Cullen, Nicklas, & Baranowski J., 2003; Rinderknecht, & Smith, 2004).

The primary concepts for changing behavior using SCT involve self control that can be achieved by setting goals, monitoring behavior through the process of change, and rewarding ones self when goals are achieved. It also involves problem solving and decision making when the goal is not achieved and how to find more effective ways to achieve the initial goal or set a new more realistic and attainable goal. The primary resources used in social cognitive theory are (a) skills and (b) self-efficacy or confidence to perform the behaviors (Baranowski, Cullen, Nicklas, & Baranowski, 2003).

During one class period each month over the course of 6 months, a 20-30-minute hands-on nutrition lesson with group activities followed by a 10-minute physical activity session was provided to the intervention group. The lessons included practical suggestions for what the youth participants could do to take action and modify their environment to promote healthier food and activity behaviors. The principal investigator with some assistance from the classroom teacher and other Extension educators provided the monthly lessons.

Following the nutrition lesson, youth participants were encouraged to choose one of the seven challenges, or "Quests," to accomplish each month. The youth participants had the opportunity to complete a total of six Quests over the course of the program and were encouraged to choose a different Quest each month. The Quest topics designed to reinforce the information that was taught in the nutrition lessons were: beverages, label reading, fruit and vegetable intake, dairy intake, breakfast, healthy snacks, and physical activity. The Quests were recorded in a calendar format, allowing the participant to record their action and annotate how they will accomplish their goal. Each Quest also included tips on how to meet the goal. Participants were instructed to review their Quest challenge with their parent.

The individual Quest challenges were collected each month, and the educator administering the curriculum tabulated a group total. The overall return rate of the monthly Quest challenges was 81%, indicating a high participation rate in the monthly take home challenges. The group was eligible for appropriate incentives (physical activity equipment, 5 - A Day water bottles, and pens) at the end of the program based on the total Quest points accumulated by the group. One-page parent newsletters with nutrition and physical activity tips were sent home with the intervention group participants once a month.

## Participant Characteristics and Procedure

Time and funding constraints limited the recruitment of program participants to three different schools in rural South Dakota (SD). Environmental and community characteristics that were identified did not change from baseline to completion of the program. Recess and physical education frequency were conducted per school policies. Table 1 provides a description of participant characteristics and study procedure.

**Table 1.**  
Participant Characteristics and Procedure

	<b>Procedure</b>			
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	<b>Sample Size and Demographics</b>		<b>Vending Machine Access</b>	<b>A la Carte During School Lunch</b>	<b>Scheduled Recess and Physical Education</b>
<b>I n t e r v e n t i o n  G r o u p</b>	<ul style="list-style-type: none"> <li>• N=98 (46% males, 54% females) 5th grade N=22 6th grade N=76</li> <li>• 77% (N=76) reside in Lake County, SD: population = 11,170(a) age ≥ 25 with a bachelor's degree or higher = 21.1%(b) per capita income = \$16,446 (c)</li> <li>• 22% (N=22) reside in Kingsbury County, SD population = 5,464 (a) age ≥ 25 with a bachelor's degree or higher = 16.2%(b) per capita income = \$16,552 (c)</li> </ul>	<p>The KidQuest program was provided during regularly scheduled classes with the 5th grade class consisting of males and females while the 6th grade classes were divided into girls and boys as per their normal health class schedule.</p>	<p>Yes: 6th grade participants No: 5th grade participants</p>	<p>Yes: 6th grade participants No: 5th grade participants</p>	<p>Average = 95 minutes per week</p>
<b>C o n t r o l  G r o u p</b>	<ul style="list-style-type: none"> <li>• N=38 (47% males, 53% females) 5th grade N=20 6th grade N=18</li> <li>• 100% (N=38) reside in Kingsbury County, SD</li> </ul>	<p>The control group did not receive program intervention.</p>	<p>Yes: 6th grade participants No: 5th grade participants</p>	<p>No: 6th and 5th grade participants</p>	<p>Average = 187 minutes per week</p>

o u p	population = 5,464 (a) age ≥ 25 with a bachelor's degree or higher = 16.2%(b) per capita income = \$16,552 (c)				
2006 U.S. Census Data. (b) 2000 U.S. Census Data. (c) 1999 U. S. Census Data.					

## Evaluation Design

### Youth Survey Tools

The survey tools of the curriculum were based on the learning objectives of the lesson plans. Intervention and control participants completed a survey at baseline and completion to evaluate the efficacy of the program in:

- General food intake patterns
- Types of foods chosen when eating out
- Nutrition knowledge of foods higher in fat
- Nutrition facts label knowledge and use
- Activity patterns.

The food intake questions were not designed to assess actual intake but rather to suggest a comparison of food frequency between the intervention and control group and how the intervention may have changed the usual patterns of the group as a result of the KidQuest program. Tables 2-5 identify the youth survey variables and the survey responses that accompany each variable.

The KidQuest program is designed to have a midpoint survey administered to evaluate changes in major behavioral patterns to allow an educator the opportunity to reinforce key messages as needed prior to conclusion of the program. This midpoint survey was administered to both groups to keep the number of times that surveys were administered consistent between the control and intervention group. The potential effect of reinforcing key messages as part of the KidQuest program on the outcome variables was not evaluated in the study.

To evaluate reliability of the survey instrument, a retest of the youth survey was administered to 52 (37% 5th grade, 63% 6th grade) of the intervention group participants 7 days after the ending survey was completed. Cronbach alpha indicators of internal consistency type reliability for the youth survey revealed that 85% of the variables had reliabilities of 0.70 and higher, 11% at 0.58-0.69, and 4% (only 1 variable - small soft drink when eating out reliability indicator of 0.4) at less than 0.50.

## Parent and Teacher Surveys

At the mid-point and at the completion of the intervention, parents were surveyed for eating and physical activity changes in their child as a result of the curriculum. The parent survey was sent home with the youth participants with an established due date for return of the completed survey to the participant's teacher. The survey also asked if information they have received in the past 3-4 months was used to change the family's eating and/or physical activity patterns. The parent survey for the intervention group specifically asked if information from the KidQuest newsletter had been utilized. The teacher survey was administered only to the intervention group to gather qualitative data about the teacher's perception of the KidQuest program.

## Evaluation Results

### Youth Survey

The youth survey evaluated 28 different variables. Each response was assigned a code. Evaluation of the intervention for the continuous response variable (1 of the 28 variables) was carried out by PROC MEANS and PROC TTEST to find the means, standard errors, and P-values when comparing within group differences between the initial and ending youth surveys. The effect of the KidQuest intervention gathered from the youth continuous variable (breakfast frequency) is shown in (Table 2). For categorical outcomes (27 of the 28 survey variables), a contingency table was constructed for the post-intervention change in each of the categorical survey responses, and an odds ratio (OR) and 95% confidence interval (CI) was determined to evaluate the direction of shift in responses supporting the research hypothesis for each of the survey variables. An outline of the survey questions, their coded responses, direction of change, and contingency table determined for the categorical youth survey variables are shown in (Tables 3-5).

A significant improvement in the number of days that breakfast was eaten was observed in the intervention group, with no significant changes in the control group (Table 2). A significant change in the increased frequency of consuming dairy foods for the intervention group as compared to the control group occurred. There were no other significant changes observed in the general food intake response variables for fruit and vegetables, sweets, chips, and sweetened beverages or the nutrition knowledge questions between groups (Table 3). There were no significant differences from baseline to ending between the intervention and control groups for foods chosen when eating out (Table 4), time spent watching TV/playing the computer, or frequency of daily physical activity (Table 5). The intervention group significantly improved in their ability to answer a food label question correctly and reported increased frequency of looking at the food label, while the control group had no significant changes in this area (Table 5).

**Table 2.**  
Youth Survey Responses: Breakfast Frequency

Survey Question Breakfast Frequency	Group	Baseline Survey			Ending Survey			P <sup>b</sup>
		N	Mean	SE <sup>a</sup>	N	Meann	SE <sup>a</sup>	

<b>How many days per week do you eat breakfast?</b> (1=1 day/week, 2=2 days/week, 3=3 days/week, 4=4 days/week, 5=5 days/week, 6=6 days/week, 7=7days/week)	Intervention	91	5.8	0.19	93	6.2	0.14	.0103*
	Control	34	6.0	0.28	36	5.6	0.33	.5720
<sup>a</sup> Denotes standard error. <sup>b</sup> Denotes paired sample t-test performed for all comparisons using SAS. *P<0.05 Survey response codes:								

**Table 3.**  
Youth Survey Responses: Food Intake Patterns and Nutrition Knowledge

<b>General Food Intake Patterns</b>						
<b>Survey Question and Coded Responses</b>		<b>N</b>	<b>% with positive change<sup>a</sup></b>	<b>Odds Ratio<sup>b</sup></b>	<b>Direction of Shift in Responses<sup>c</sup></b>	<b>Confidence Interval (LCL,UCL)<sup>d</sup></b>
<b>Dairy Foods (milk, yogurt, cheese)</b> 1=hardly ever, 2=<3 times/day, 3=3 times/day, 4=4 times or >/day	Intervention	88	43%	3.15	Higher Intake	(1.25, 7.96)
	Control	36	19%			
<b>Fruit or Vegetables</b> 1=hardly ever, 2=<3 times/day, 3=3-4 times/day, 4=5 times or >/day	Intervention	88	31%	1.15	No Change	(0.49, 2.72)
	Control	36	28%			
<b>Sweets (candy, cake, donuts, pie, or cookies)</b> 1=hardly ever, 2=4-6 times/week, 3=1 time/day, 4=2-3 times/day, 5=4 times or >/day	Intervention	89	54%	0.94	No Change	(0.43, 2.04)
	Control	36	56%			

<b>Chips</b> 1=hardly ever, 2=4-6 times/week, 3=1 time/day, 4=2-3 times/day, 5=4 times or >/day	Intervention Control	89 35	39% 51%	0.61	No Change	(0.28, 1.35)
<b>Regular Pop</b> 1=hardly ever, 2=4-6 times/week, 3=1 time/day, 4=2-3 times/day, 5=4 times or >/day	Intervention Control	87 35	36% 37%	0.94	No Change	(0.42, 2.11)
<b>Fruit Drinks, Gatorade, Kool-Aid</b> 1=hardly ever, 2=4-6 times/week, 3=1 time/day, 4=2-3 times/day, 5=4 times or >/day	Intervention Control	89 36	49% 33%	1.96	No Change	(0.87, 4.39)
<b>Nutrition Knowledge: Which food has more fat?</b>						
<b>Nacho Cheese Doritos or Pretzels</b> 2=Doritos (correct answer), 1=Pretzels (incorrect answer)	Intervention Control	81 29	15% 10%	1.51	No Change	(0.39, 5.77)
<b>Ice Cream or Fruit</b> 2=Ice Cream (correct answer), 1=Fruit (incorrect answer)	Intervention Control	80 32	3% 0%	-- <sup>e</sup>	No Change	ns <sup>e</sup>
<b>Whole Milk or 1% Milk</b> 2=Whole Milk (correct answer) 1=1% Milk (incorrect answer)	Intervention Control	81 28	12% 11%	1.74	No Change	(0.30, 4.61)
<b>Donut or Breakfast</b>	Intervention	82	1%	0.37	No Change	(0.02, 6.11)



<b>Cereal with 1%</b> 2=Donut (correct answer) 1=Cereal with Milk (incorrect answer)	Control	31	3%			
<b>Candy Bar or English Muffin with Cheese</b> 2=Candy Bar (correct answer) 1=English Muffin (incorrect answer)	Intervention Control	85 35	6% 4%	0.67	No Change	(0.15, 2.95)

<sup>a</sup> Analyzed using a contingency table with change in response determined by subtracting the initial survey responses from the ending survey responses and categorizing the change score as: no change or a change in response indicating no improvement (positive change absent) and a change in response indicating improvement (positive change present).

<sup>b</sup> Intervention (I) Odds = Present (I)/Absent (I), Control (C) Odds = Present (C)/Absent (C). Odds Ratio = Odds (I) / Odds (2); interpreted as the relative likelihood of a positive change in the intervention group versus control group.

<sup>c</sup> An Odds Ratio >1.0 and Confidence Intervals at 95% that do not include 1.0 support the research hypothesis.

<sup>d</sup> LCL=lower confidence limit, UCL=upper confidence limit

<sup>e</sup> ns: not significant (p > 0.05) using a chi-square test of association. The odds ratio could not be calculated because of a zero count for a cell.

**Table 4.**  
Youth Survey Responses: Eating Out

<b>Food Choices When Eating Out</b>						
<b>Survey Question and Coded Responses</b>		<b>N</b>	<b>% with positive change<sup>a</sup></b>	<b>Odds Ratio<sup>b</sup></b>	<b>Direction of Shift in Responses<sup>c</sup></b>	<b>Confidence Interval (LCL,UCL)<sup>d</sup></b>
<b>Large Fries</b> 1=never, 2=sometimes, 3=often	Intervention	89	27%	2.29	No Change	(0.80, 6.57)
	Control	36	14%			
<b>Small Fries</b> 1=never, 2=sometimes, 3=often	Intervention	98	29%	1.24	No Change	(0.54, 2.86)
	Control	41	24%			
				1.80	No Change	(0.67, 4.87)

<b>Large Pop</b> 1=never, 2=sometimes, 3=often	Intervention Control	89 37	26% 16%			
<b>Small Pop</b> 1=never, 2=sometimes, 3=often	Intervention Control	92 41	35% 29%	1.17	No Change	(0.53, 2.59)
<b>Diet Pop</b> 1=never, 2=sometimes, 3=often	Intervention Control	98 39	20% 13%	1.85	No Change	(0.64, 5.31)
<b>Water</b> 1=never, 2=sometimes, 3=often	Intervention Control	98 41	36% 49%	0.58	No Change	(0.28, 1.22)
<b>Grilled Chicken Sandwich</b> 1=never, 2=sometimes, 3=often	Intervention Control	98 41	21% 12%	1.96	No Change	(0.69, 5.63)
<b>Sub Type of Sandwich</b> 1=never, 2=sometimes, 3=often	Intervention Control	98 41	23% 22%	1.09	No Change	(0.45, 2.61)
<b>Salad</b> 1=never, 2=sometimes, 3=often	Intervention Control	98 41	16% 32%	0.42	No Change	(0.18, 0.98)
<b>Fruit</b> 1=never, 2=sometimes, 3=often	Intervention Control	98 41	18% 5%	4.39	No Change	(0.97, 19.87)
<b>Yogurt</b> 1=never, 2=sometimes, 3=often	Intervention Control	98 41	33% 22%	1.72	No Change	(0.74, 4.04)

<sup>a</sup> Analyzed using a contingency table with change in response determined by subtracting the initial survey responses from the ending survey responses and categorizing the change score as: no change or a change in response indicating no improvement (positive change absent) and a change in response indicating improvement (positive change present).

<sup>b</sup> Intervention (I) Odds = Present (I)/Absent (I), Control (C) Odds = Present (C)/Absent (C). Odds Ratio = Odds (I) / Odds (2); interpreted as the relative likelihood of a positive change in the intervention group versus control group.  
<sup>c</sup> An Odds Ratio >1.0 and Confidence Intervals at 95% that do not include 1.0 support the research hypothesis.  
<sup>d</sup> LCL=lower confidence limit, UCL=upper confidence limit

**Table 5.**  
 Youth Survey Responses: Food Label and Activity Patterns

<b>Nutrition Facts Food Label</b>						
<b>Survey Question and Coded Responses</b>		<b>N</b>	<b>% with positive change<sup>a</sup></b>	<b>Odds Ratio<sup>b</sup></b>	<b>Direction of Shift in Responses<sup>c</sup></b>	<b>Confidence Interval (LCL,UCL)<sup>d</sup></b>
<b>I look at the nutrition facts food label on foods:</b> 1=never, 2=sometimes, 3=often	Intervention	88	30%	4.61	Higher Frequency	(1.30, 16.39)
	Control	36	8%			
<b>I use the nutrition facts food label to help me choose foods to eat less of and healthier foods to eat more of:</b> 1=never, 2=sometimes, 3=often	Intervention	87	32%	2.21	No Change	(0.83, 5.96)
	Control	34	18%			
<b>Using the nutrition facts label, the total amount of fat for the whole package is?</b> 1=10 grams (incorrect), 1=18 grams	Intervention	86	33%	4.83	Higher Correct Responses	(1.36, 17.18)
	Control	33	6%			

(incorrect), 2=30 grams (correct)						
<b>Activity Patterns</b>						
<b>I usually watch TV or play computer games:</b> 1=hardly ever, 2= <30 min/day, 3=30-45 min/day, 4=1 hr/day, 5=2 hrs or >/day	Intervention Control	87 36	40% 47%	0.75	No Change	(0.34, 6.57)
<b>I do a total amount of physical activity each day:</b> 1=hardly ever, 2= <30 min/day, 3=30-45 min/day, 4=1 hr/day, 5=2 hrs or >/day	Intervention Control	87 36	22% 22%	0.98	No Change	(0.38, 2.49)
<p>a Analyzed using a contingency table with change in response determined by subtracting the initial survey responses from the ending survey responses and categorizing the change score as: no change or a change in response indicating no improvement (positive change absent) and a change in response indicating improvement (positive change present).</p> <p><sup>b</sup> Intervention (I) Odds = Present (I)/Absent (I), Control (C) Odds = Present (C)/Absent (C). Odds Ratio = Odds (I) / Odds (2); interpreted as the relative likelihood of a positive change in the intervention group versus control group.</p> <p><sup>c</sup> An Odds Ratio &gt;1.0 and Confidence Intervals at 95% that do not include 1.0 support the research hypothesis.</p> <p><sup>d</sup> LCL=lower confidence limit, UCL=upper confidence limit&lt;</p>						

## Parent Responses

Parent survey responses were analyzed separately for the mid-point and ending parent surveys. Missing data for the variables from the parent surveys ranged from 17-22% for the mid-point survey and 27-29% for the ending parent survey responses. Utilizing a chi-square test, there were not statistically significant differences in "yes," "no," or "not applicable" responses when comparing the intervention and control group parent

surveys for food intake and activity pattern observations.

There was a significantly higher report of "yes" responses for the parent intervention group when asked if there had been information provided that the family has used to change eating (P= 0.004) and physical activity patterns (P= 0.005), which could indicate that the information shared from the Quest challenges and the monthly parent newsletter were effective program communication tools.

The parent/guardian survey comments were combined from the mid-point and ending parent surveys. Comments were categorized by main themes. Main themes and examples are shown below. All of the parent comments from the surveys were positive and expressed a positive change.

**Prompted discussion on choices with parents:**

"Talks about healthy food choices, activities and makes better decisions."

"Promoted conversations several times on health related nutrition topics."

"\_\_\_\_\_has asked more questions about why it is important to eat healthy and be active."

"We appreciate the newsletter; it's always nice to hear reinforcement. This program is a good idea!"

**Dietary intake and behavior:**

"Smaller portions and label reading."

"Checks food labels for nutrition information."

"Eats healthier snacks."

"She pays more attention to the snacks she has, has been eating more fruit."

"It has made us aware of the amount of junk food that we consume and now we are eating healthier."

"\_\_\_\_\_ has asked for more fruits."

"We have gotten more vegetables at the store."

"\_\_\_\_\_ eats more and will try more fruit and vegetables."

"We are eating more vegetables."

"We have noticed our child ordering more bottled water at Sat. events we attend." "She has been more aware of her pop intake and also discovered yogurt."

"I have my kids drink more milk and less pop."

"She also is more conscious when looking at a menu. Good job!"

" \_\_\_\_ has been making better choices when we eat out."

### **Physical activity patterns:**

" \_\_\_\_ did make more of a point to exercise over last 3-4 mo."

"She is more physically active."

"not as lazy"

"we have all tried to become more active."

### **Teacher Response**

The 6th grade intervention group teacher commented the following on her survey, "This is a program that really works by engaging all students. Students are actively engaged in this program. They have been creating activities, songs, and poetry about nutrition."

## **Lessons Learned**

The evaluation of the KidQuest program suggests that youth in the 5th and 6th grade were receptive to many of the interventions. Self-reported improvements in breakfast frequency, dairy intake, increased frequency of looking at the food label, and increased food label knowledge were observed in the intervention group, with no significant change in the control group.

The results of the study were limited by the sample size and unequal number of participants in the intervention and control groups. An additional consideration may be the potential for a difference in the learning environment and responses for the participants who were in the co-ed vs. single sex settings. Data assessing the efficacy of KidQuest comparing the different classes that comprised the intervention and control groups were not evaluated for the study. The size of the communities between the intervention and control group range from a population of approximately 6000 to 11,000; however, both are rural South Dakota counties with residents who live in settings with similar access to convenience stores and restaurants. An additional limitation is that actual behavior change was measured using self-reported surveys. However, the youth survey questions were tested for reliability, and all were considered reliable with the exclusion of one variable, thus allowing for a reasonable identification of relationships among variables.

## **Implications for Further Research and Practice**

Educators from many different disciplines (Extension, wellness, school systems, etc.) are searching for avenues to integrate healthy messages and behavior change for youth in an effort to reverse the rising trends of youth overweight and obesity. As preadolescents begin to make many of their own eating and physical activity decisions, they represent an audience of opportunity for interventions that will formulate behaviors with the possibility of those behaviors persisting into adulthood. The strengths of the KidQuest program involve a multifaceted process based on social cognitive theory. The combination of repeated contacts, hands-on lessons, Quest challenges with goal setting, tracking and a group reward, and the parent newsletter are all key components of the KidQuest program.

Evaluating program impact is an important component of any curriculum or educational program. Extension educators as well as other educators in the community or school setting may be challenged in evaluating

program impact due to lack of adequate survey tools and time. The KidQuest curriculum reduces potential barriers to evaluating program impact by providing a complete set of instructions on using the youth, parent, and teacher surveys with a software component utilizing Microsoft Excel® that will calculate percent of change for the survey variables when the survey responses are entered. This allows an educator to determine program impact with reduced time and monetary contributions.

The mid-point survey also allows educators to evaluate changes in intake and activity patterns and provides an opportunity to reinforce educational messages with remaining contacts until conclusion of the program. Repeat messages using the KidQuest curriculum were provided for television/computer time, physical activity, regular soda intake, large fries intake, dairy intake, food label use, and food label knowledge. Significant changes in the intervention group were seen in some of the variables that were repeated as identified by the mid-point survey (dairy intake, food label use, and food label knowledge).

Future efforts in nutrition and physical activity initiatives for the 5th to 6th grade population may benefit by utilizing the KidQuest program and its approach. Longitudinal studies on the efficacy of the KidQuest program utilizing a cross age teaching model and a university peer mentoring system to build program sustainability in rural South Dakota schools is being developed by departments in Cooperative Extension and Nutrition at South Dakota State University.

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