

Classroom Nutrition Education Builds a Strong Foundation

Kindergarten and transitional kindergarten students improve nutrition knowledge:
Results of formative evaluation.

Introduction

Healthy People 2020 indicates that childhood obesity rates need to decline from nearly 17% to 14.5% to reach target to improve American children's health^{1,2}. School-based nutrition and physical activity interventions may help prevent or minimize unhealthy weight gain in children³. Health education in schools could have a moderate impact on public health as documented through the RE-AIM framework⁴⁻⁶. Schools provide access to a large number of children and families, making for a convenient setting to reach significant numbers.

Through 8 classroom units, the *Building a Healthy Me!* kindergarten nutrition program seeks to improve kindergarten and transitional kindergarten students' knowledge of food groups and attitudes toward eating with an ultimate goal to achieve behavior change.

Study Design

In the 2013–2014 school year an evaluation project of the *Building a Healthy Me!* program was conducted with the oversight of external evaluation consultants. The formative evaluation sought to determine the extent to which the unit effectively changed students' and parents' nutrition knowledge and attitudes and to identify early changes in food choices—particularly in the areas of food groups, snacks and breakfast. Teachers' implementation of and satisfaction with the program were also assessed.

Twenty-five kindergarten and 4 transitional kindergarten classrooms throughout California were enrolled in the study. In order to reduce selection bias, whenever feasible 1 classroom was randomly chosen per school to participate from among teachers volunteering to participate in the evaluation. A quasi-experimental design assessed changes in the outcomes, with pre- and post-surveys completed in the intervention group.

Pre- and post-surveys assessed changes in students' nutrition knowledge and dietary intake behaviors. Pilot testing in 3 classrooms indicated that student survey items had acceptable levels of test-retest reliability. Nutrition-related parenting practices were assessed in pre- and post-surveys. Pre-surveys were administered before each classroom began the nutrition units. Students, teachers and parents completed the post-surveys immediately after concluding the 8-unit course of activities. The control group completed post-surveys at the same time as the intervention group. The non-randomized, post-only control group was included to explore the extent to which development and maturation may account for observed changes in student knowledge across the year. Completion of surveys was voluntary for students and parents. Table 1 provides the timeline.

Table 1: Study and measurement design for the formative evaluation

	Aug 2013	Oct 2013 (pre-surveys)	Nov 2013–Feb 2014	Mar 2014 (post-surveys)
Pilot testing	○			
Intervention group		○	X	○
Control group				○

X = *Building a Healthy Me!* curriculum implementation; ○ = Assessment



Results

Teacher Implementation and Satisfaction With the Program

Each of the 8 nutrition units include 4 activities. Teachers were asked to implement 3 activities of their choice for each unit. Supplemental activities were available yet these were optional to teach. Overall, teachers agreed that the *Building a Healthy Me!* activities helped achieve unit objectives, and students were interested in the activities.

Based on completed teacher logs for each unit's main activities and supplemental materials, most of the teachers taught the majority of the main activities in each unit. The average implementation rate was 83% across all activities in each unit. Average teacher preparation time for these main activities ranged from 3 to 8 minutes. Average class time for these main activities ranged from 11 to 19 minutes.

Teacher Evaluation of the *Building a Healthy Me!* Program

Parent and teacher satisfaction with the program were high.

Based on data from 62 classroom observations, focus groups and teacher survey results, *Building a Healthy Me!* was implemented with a high degree of fidelity. Teachers were very satisfied with the materials and found the lessons easy to use, engaging and enjoyable. Teachers felt the units met their objectives, and students were actively engaged in the activities; family homework was fairly well received by students and their parents.

“ I really like the program. The songs and posters help the children to engage right away. They make all kinds of connections. The extension activities are well planned—good active learning. ”

—Kindergarten teacher

Teachers' ratings for the *Building a Healthy Me!* units achieving their objectives ranged from a high of 4.75 out of 5 for Unit 1 (food groups) to 4.36 for Unit 5 (breads + cereals). Teachers voted the unit on vegetables as their favorite followed by snacks, fruits and milk. Table 2 shows teachers' satisfaction with the support materials. A majority of the teachers utilized the support materials (ranged from 22 to 29 teachers), and their satisfaction was high, with the exception of the online resources, which have been updated since the evaluation. Teachers were very satisfied with how nutrition activities related to the Common Core State Standards.

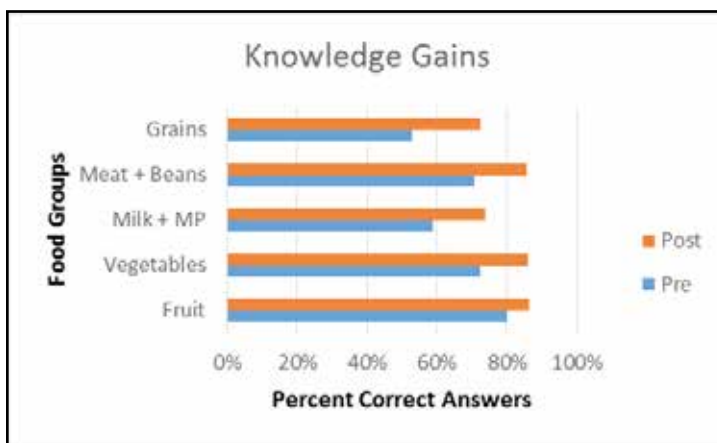
Students significantly increased nutrition knowledge

A total of 713 students completed the pre-survey (n = 604 from traditional kindergarten and n = 109 from transitional kindergarten), and 715 students completed the post-survey (n = 603 from traditional kindergarten and n = 112 from transitional kindergarten). At post-survey, an additional 103 students from traditional kindergarten also completed the survey as the control group. Thus, there were 706 students from traditional kindergarten at post-survey.

Results revealed that the percent of students to correctly answer each nutrition question increased significantly over time, indicating a measurable improvement in nutrition knowledge among students ($p < 0.01$). Figure 1 shows the percentage of students correctly identifying foods in each food group on the pre- and post-survey.

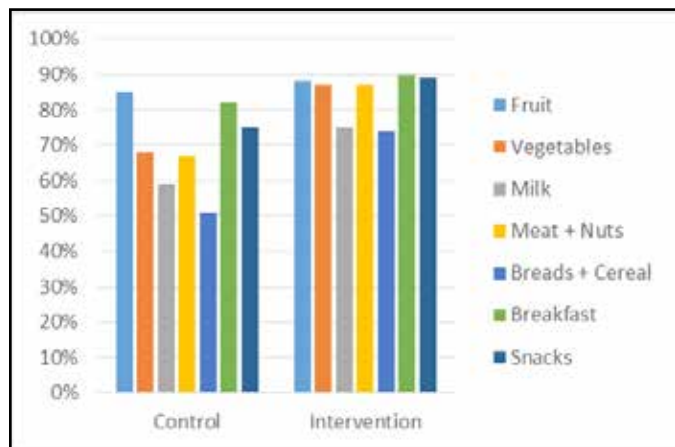


Figure 1. Percent of students correctly identifying foods in each food group at pre- and post-survey



Students in the intervention classrooms had a greater percentage of correct nutrition knowledge answers on the post-survey than students in the control classrooms, with the exception of the Fruits food group. These findings suggest that the observed improvements in the intervention group may be due to children’s increased knowledge beyond maturation over the course of the school year. Figure 2 compares nutrition knowledge of traditional kindergarten students from intervention and control groups on the post-survey. Despite increases in knowledge, very few changes in child dietary intake were observed as a result of the *Building a Healthy Me!* program.

Figure 2. Post-survey differences in nutrition knowledge between the intervention and control groups



Students’ improved their Food Choices According to Parents

Results demonstrated that between the pre- and post-survey students participating in the *Building a Healthy Me!* nutrition program did have some significant increases in their consumption of food-group foods. However, there were not enough participants in the study for these changes to reach statistical significance. Future studies should include a larger sample size for more statistical power.

Parents reported slight increases in the amount of time they spoke with their children about food and nutrition

A total of 480 parents completed pre-surveys (77% response rate), and 417 completed post-surveys (67% response rate); 279 had matched pre- and post-surveys (45%). Seventy-eight of the respondents were parents of students in transitional kindergarten classrooms, and 543 had students in traditional kindergarten classrooms. Total participation by separate individuals was 621, the number of surveys collected from separate individuals.

Parent self-reports on the influence of the family nutrition information booklet were positive:

- Almost all parents (94%) were aware that their children were learning about nutrition at school.
- Over two-thirds of parents (68%) reported that they did see the *Dear Families Building a Healthy Me!* booklet. About 40% of parents reported that they posted the Shopping List from the booklet on their refrigerator.
- Close to 33% of parents discussed at least a little of the nutrition information with their children, while over half of parents (~55%) discussed some or most of the information.
- Almost 60% of parents reported that the booklet influenced their choices at least some, and 19% reported that it greatly influenced their choices.

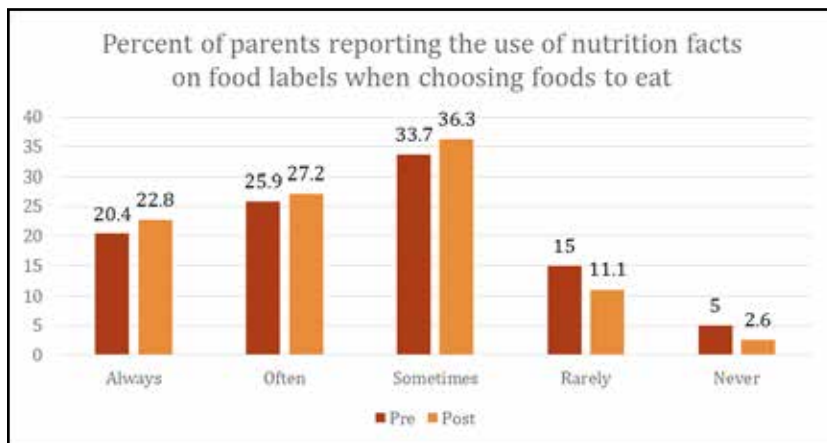
“Overall students loved having their own workbooks. They were proud to bring them home to show their parents.”
—Kindergarten teacher

Four of the 8 units included family homework to encourage dialogue about nutrition in the home; 80% of parents completed this family homework. Parent post-surveys indicated the most frequently observed changes among students were:

- Asking for healthy snacks (47%)
- Wanting to help prepare meals (41%)
- Talking about foods from the food groups (35%)
- Showing more interest in new foods (30%)

Parent were more aware of nutrition facts on food labels after *Building a Healthy Me!* There was a statistically significant difference between the pre- and post-surveys ($p < 0.001$), in which parents were more likely to use nutrition facts on food labels after the nutrition program, as shown in Figure 3.

Figure 3. Pre- and post-survey results showing the percent of parents using nutrition facts on food labels when choosing foods to eat.



Conclusions

Results from this formative evaluation found large and consistent positive improvements in student nutrition knowledge after participation in the *Building a Healthy Me!* program. Results from the student surveys showed significant improvements in students' nutrition knowledge for all of the content areas tested:

1. Classification of foods into 5 food groups
2. Healthy snacks
3. Importance of breakfast

Post-survey nutrition knowledge scores were significantly higher in the intervention group than in control classrooms that did not receive the units. This evidence lends support to the conclusion that *Building a Healthy Me!* did indeed significantly increase nutrition knowledge above and beyond normal changes in cognitive development and maturation taking place across kindergarten. To test the sustainability of these effects, and further rule out concerns about maturation effects, results should be replicated through a summative evaluation with a randomized control design with pre-surveys, post-surveys and 3-month follow-up surveys administered to both intervention and control groups.

Most teachers taught a majority of the activities in each unit, and program satisfaction was high. While parents also gave the program high approval ratings, very few changes in parenting practices and child dietary intake were observed as a result of the nutrition program. Still, evidence suggests that school-based interventions can have broader influences on home environments when including components aimed to change parents' knowledge, attitudes and practices regarding children's nutrition, which suggests further research should be considered for the home environment⁷⁻⁸.

The peer-reviewed [Journal of School Health](#) published the evaluation of the nutrition lessons describing the program effectiveness using the RE-AIM framework and its potential public health impact for kindergartners⁹.

Dairy Council of California could not have conducted this large-scale project without the passionate support of the 53 teachers that participated along with their students and families. We thank these teachers, administrators and families for their support.

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