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A “Healthy Pizza Kitchen” Nutrition Education Program at a Children’s Health Museum

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INTRODUCTION

For nutrition education to be successful in changing behavior, schools, families, and communities must participate in/provide a variety of diverse, creative, accessible, and culturally appropriate programs. One venue for provision of nutrition education is a health and science education center that has exhibits and special programs not found in an average school. Establishing relationships with these organizations could greatly enhance school health curriculum (1). Although nutrition information, displays and programming are often found in these centers, studies examining whether provision of nutrition education in these venues increases knowledge or changes behavior are lacking. The purpose of this study, based on social cognitive theory, was to evaluate the effectiveness of a field trip to an interactive health museum with a hands-on “Healthy Pizza Kitchen” exhibit in teaching basic nutrition concepts relating to MyPyramid and creating balanced meals to multi-ethnic 5th grade students.

PROGRAM DESCRIPTION AND IMPLEMENTATION

The venue for this intervention was the [blinded for review], a small health museum and science center sponsored by [blinded for review], and located in [city]. The intervention consisted of a free, 90-minute field trip to the museum. Prior to the intervention, all 5th grade teachers from surrounding schools who had participated in field trips to this museum within the past 2 years were recruited to sign up for an upcoming field trip. After appointments with 6 teachers (representing 200 students) were scheduled, a 19-question pretest was mailed to them. Teachers were instructed not to discuss material on the tests, which were designed to determine

student knowledge of food groups and whether they could identify what makes pizza healthful or unhealthful, but to have students complete tests 2 weeks prior to visiting the museum.

When children arrived at the museum, they were directed to the auditorium for a 30-minute presentation on MyPyramid, making healthful food choices, and creating balanced meals. Pizza was discussed in terms of what makes it healthful or unhealthful, and how to modify the ingredients to make it a healthful, balanced meal. Plastic toppings (cheese, chicken, peppers, pineapple), a silicone pizza crust, and pizza sauce made from a red vinyl disc were used as props to discuss food groups. One presentation was given to each group of students by the same docent (a nutrition graduate student), using the same script and props. Afterwards, children explored the museum. They were encouraged to use the new “Healthy Pizza Kitchen” (HPK) nutrition exhibit, a mock pizzeria with a menu board that lists healthy pizza ingredients according to food groups, a pizza assembly table, a “brick” pizza oven, and a table for “eating” the pizza. Students were shown the basic fundamentals of pizza making, and encouraged to make their own pizzas using synthetic crusts and toppings.

Following the field trip, teachers were asked to refrain from discussing nutrition information presented to students at the museum, and to distribute posttests 2 weeks later.

EVALUATION

Of the 200 students who visited the museum, 151 (69 boys, 82 girls) from 6 different schools (92% public; 8% private) completed pre- and posttests. Differences based on ethnicity were assessed using the chi-square test of homogeneity. Differences between pre- and posttests were determined using the McNemar’s change test. Data were analyzed using SPSS version 13.0 for Mac (SPSS, Chicago, IL, 2006) and statistical significance was set at $P < .05$.

Results indicate MyPyramid recognition increased from 72% to 93% ($P < .01$). Prior to the intervention, there was a significant difference ($P < .001$) between race and recognition. More Hispanic (44%) and African American (40%) compared to Asian (13%), and Caucasian (5%) participants reported never having seen the MyPyramid graphic. Although posttests showed no difference between race and recognition, 10% of Hispanic participants maintained no recognition of MyPyramid. After the intervention, significantly more (54%) students correctly stated the correct number of food groups, compared to 14% before the intervention ($P < .01$). There was no significant difference between race or gender and food group knowledge.

More than 80% of respondents indicated that they liked, liked a lot, or loved pizza, with 54% reported eating pizza at least once a week at school, and 47% eating it once a week outside of school. There was no effect of race or gender on pizza consumption. When asked whether or not they thought pizza was “junk food”, 74% of students responded at posttest “it depends”, up from 47% at pretest ($P < .01$). Students were asked to identify what pizza toppings made a pizza more or less healthful. After the intervention, significantly more students were able to identify low-fat cheese ($P < .001$), mushrooms ($P < .01$), and green peppers ($P < .001$) as more healthful toppings and high-fat cheese ($P < .05$), sausage ($P < .05$) and pepperoni ($P < .001$) as less healthful toppings.

Since posttests were administered 2 weeks after students visited the museum to assess knowledge retention, the main study limitation was the inability to control for exposure to nutrition information following museum attendance. It is possible, though not likely, that knowledge about what makes a pizza healthful was gained from other sources, rather than from the museum lecture and exhibit.

CONCLUSION

Approximately 30% of a child's daily calorie intake is through snack foods, desserts, and pizza (2). Although pizza is often considered "junk food", it has the potential to be a healthy balanced meal when it contains foods from all food groups. This study reports that students attending a lecture and participating in a hands-on interactive "Healthy Pizza Kitchen" health museum exhibit learned how pizza can be a healthful, balanced meal, depending on the ingredients used in its preparation, and what ingredients make it more/less healthful. Since this intervention used a combination of lecture and hands-on experiential learning, it is unknown whether participating in either activity alone would have similar outcomes. Further, even though food models, rather than real food, were used in this intervention, results support other studies reporting that hands-on cooking activities aid in nutrition education knowledge and improvement in children's food choices (3,4). Using food models, however, is less expensive than using real foods, and as such, interventions such as the one described here can reach more students, especially in an educational setting such as a health museum. Because science and health education centers have programs that are not provided in an average school (5), and school field trips can have long-lasting positive effects on children (6), programs like the "Healthy Pizza Kitchen", which uses a favorite food, can be used to help educate school aged children on healthful eating. Exhibits that include other familiar child-friendly foods, such as sandwiches, hamburgers, and burritos could easily be designed to instruct students about making balanced, healthful meal choices.

NOTES

Research protocol was reviewed and approved by the San Jose State University and Children's Hospital and Research Center-Oakland Institutional Review Boards for human subjects, and

included parental permission and child assent. The author would like to acknowledge Diane Vecchi, MS, RD for help in designing the HPK, presenting classes, and analyzing data.

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