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Just Be It! Healthy and Fit Increases Fifth Graders' Fruit and Vegetable Intake, Physical Activity, and Nutrition Knowledge

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Abstract: Just Be It! Healthy and Fit reduces the risk factors for childhood obesity for fifth graders using hands-on field trips, in-class lessons, and parent outreach efforts. Pre-test and post-test scores from the year-long classroom instruction showed a statistically significant increase in fruit and vegetable intake, physical activity, and nutrition knowledge for the students. Parents also gained nutrition knowledge. The program enables students who are at risk for childhood obesity to develop a healthy lifestyle and reduce the risk of health disorders such as diabetes and heart disease in childhood and in adulthood.

Background

Obesity rates for children in the United States have increased over the past thirty years. In 1971 about 5% of children, aged two to 19 years, were obese. By 2002 nearly 15% of children were considered obese (Anderson & Butcher, 2006). The increase in childhood obesity is related to an increase in adult obesity. Obese children are much more likely than normal weight children to become obese adults. A study from the late 1990's showed that 52% of children who were obese between the ages of three and six were obese at age 25 compared to 12% of normal and underweight three to six year old children (Anderson & Butcher, 2006).

Although obesity is expected to increase with age, obesity today is increasing with age more quickly than it did 30 years ago. If researchers in 1971 tried to project how many 10-year-olds would be obese by the time they turned 40 in 2001, they would have predicted the rate to be 10-15%. However, in 2002 the rate was close to 30%. This change in the relationship between age and obesity has important implications for predicting how many adults will have obesity-related health problems as they age (Anderson & Butcher, 2006).

In New Mexico, the rate of childhood overweight and obesity for children aged 10-17 is 32.7%, according to a 2007 National Survey of Children's Health. Children with a body mass index at or above the 95th percentile for their age are considered obese, and children at or above the 85th percentile are considered overweight (Robert Wood Johnson Foundation, 2009).

Obesity is a significant risk factor for a variety of chronic diseases in adults, including high blood pressure, high cholesterol, heart disease and stroke, gallbladder disease, and certain types of cancer. Additionally, overweight and obesity are closely linked to diabetes. There was an estimated 37% increase in diabetes prevalence in New Mexico from 1990 to 2000. Furthermore, Type 2 diabetes, previously considered an adult disease, has increased dramatically in children and adolescents (New Mexico State Department of Education & New Mexico Department of Health, 2001).

Improvement in health and well-being for all children, both immediate and long term, is the desired outcome of addressing childhood overweight and obesity. According to the World Health Organization (2003), health is "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity". Consistent with this, encouraging a health-centered, rather than weight-centered approach, places the focus on the whole person, physically, mentally, and socially. The health-centered approach emphasizes living actively and eating in normal, healthful ways.

The educational program, Just Be It! Healthy and Fit (JBI), decreases the risk factors for childhood obesity by implementing the concepts that reduce obesity identified by the World Health Organization (2003). The program promotes regular physical activity; provides nutrition education to students, teachers, and parents; and affects change in the home and school environment to support healthy food choices for children.

JBI contains the basic elements that research has shown to reduce the risks of obesity for children. Childhood obesity and overweight can be prevented by providing nutrition education in which students learn to make nutritious food choices and choose appropriate serving sizes of food, as well as increasing the time spent in physical exercise (Sheehy & Dharod, 2008).

Changing the home and school environment has also been shown to be effective in risk reduction. Parents who purchase and serve nutritious foods in appropriate quantities, promote physical activity, and limit TV viewing are more likely to have children who adopt healthy lifestyles. Teachers who provide times for children to exercise and reinforce nutrition education concepts also provide environmental support for children (Haskins, Paxson, & Donahue, 2006; Lanigan & Power, 2008).

Programs that teach both parents and teachers to create active environments, provide nutritious foods, and model appropriate eating and physical activity have been effective pieces of an overall program (Story, Kaphingst, & French, 2006; Ontai, Williams, Lamp, & Smith, 2007). School-based programs that incorporate parenting and at-home components into the curricula are more effective than stand-alone school-based programs. (Lindsay, Sussner, Kim, & Gortmaker, 2006).

JKI promotes healthy lifestyles by reducing risk factors for childhood obesity for fifth graders in the New Mexico counties of Rio Arriba, Santa Fe, and Los Alamos. Program goals are to increase nutrition knowledge, increase fruit and vegetable intake, and increase physical activity levels for fifth graders. The program's goals were achieved by targeting teachers, students, and parents utilizing three teaching methods: a hands-on field trip, in-class lessons taught throughout the school year, and parent outreach efforts.

Project Description and Evaluation

Research questions for the project were:

- Does the JKI curriculum increase nutrition knowledge, fruit and vegetable intake, and physical activity for fifth graders?
- Do JKI parent outreach resources increase parent nutrition knowledge?

Procedure

At the beginning of the school year, JKI personnel contacted schools to participate in the field trip. They planned, conducted, and evaluated field trips using a nutrition knowledge pre-test and post-test. Of the participants in the field trips, about one-third were chosen for the in-class lessons. The JKI in-class lessons were delivered throughout the school year and used pre-tests and post-tests to measure knowledge gain and behavior change. During the school year, students delivered newsletters and other nutrition education resources to their parents. Parent knowledge was evaluated at the end of the year using a retrospective post-test that was delivered and returned by the student.

Program Participants

From 2006-2009, 2,079 fifth graders from 12 elementary schools in three counties attended the field trips. Of the students who participated in the field trips, 679 students received in-class lessons from JKI personnel. 53% were female, and 47% were male. 49% were Hispanic; 39% Anglo; 9% American Indian; 2% Asian; and 1% African American.

Field Trip

The field trip component was used to get teachers and youth excited about nutrition and fitness. Students were bused to an off-site location where they participated in a fun orientation including the JKI trivia game. They rotated among four 45-minute workshops and ate a nutritious lunch. The workshops included:

- "MyPyramid," which illustrated serving sizes within each food group and how nutrients contribute to good health.

- "Vary Your Veggies and Focus on Fruits," which taught nutritional qualities of vegetables and fruits, and had students set goals to eat more fruits and vegetables.
- "Power Up with Exercise," which asked students to move more and sit less by participating in aerobic, strength, and flexibility activities.
- "Fun with Food Facts," which taught students how to read nutrition facts labels and to evaluate how media messages affect food choices.

Students who attended the field trip completed a pre-test and post-test for nutrition knowledge. They showed a knowledge gain of 37% in 2006; 43% in 2007; 44% in 2008; and 52% in 2009.

In-Class Lessons

Twelve to 14 lessons were delivered throughout the year. The lessons consisted of nutrition concepts, how to make a healthy snack, and time for a physical activity. Nutrition concepts included: Food Safety, Grains Group, Milk Group, Meat & Beans Group, Fruit Group, Vegetable Group, Serving Sizes, and Healthy Fast Food Choices.

Nutrition knowledge gained from the in-class lessons was measured through pre-tests given in September and post-tests administered in May. In 2006-2007, an experimental research design compared students in a control group to those in a treatment group. The control group of 62 students had a pre-test score of 57% and post-test score of 62%. The treatment group of 121 students scored 61% on the pre-test and 89% on the post-test. While the control and treatment group were similar on the pre-test, their post-test scores were significantly different from one another. The knowledge gain differences for the treatment group were also statistically significant.

From 2007-2009, pre-test and post-test scores for the nutrition knowledge test were analyzed using a paired t-test.

- Nutrition knowledge gain for 2007-2008 was 6.05 and statistically significant at the .0001 level.
- Nutrition knowledge gain for 2008-2009 was 5.36 and statistically significant at the .0001 level.

Changes in fruit and vegetable intake and physical activity levels were measured using standardized food frequency and physical activity surveys. Data collected from 2006-2008 were unusable because students could not accurately report the amount of food they ate and how much activity they had for the past 2 days. For example, a student reported he ate 5 cups of broccoli and walked for 2 hours. This over-estimation was a common response from the students.

A new instrument, which was more developmentally appropriate, was developed, and results from the pre-tests and post-tests for 2008-2009 showed an increase in the frequency of eating fruits and vegetables and physical activity levels. This instrument asked students to report the number of fruits and vegetables eaten and activity level using the terms: none, not too many, some, a lot, a whole lot, and a really whole lot. Students were more able to accurately estimate the amount of food eaten and physical activity using this type of scale. A comparison of pre-tests and post-tests showed the following.

- The increase for eating fruits was .40 and statistically significant at the .0016 level.
- The increase for eating vegetables was .49 and statistically significant at the .0001 level.
- The increase for physical activity was .32 and statistically significant at the .0101 level.

Parent Outreach

Parents received information throughout the school year in the form of handouts and brochures, newsletters, and a parent information night. Increase in parental knowledge was measured through a retrospective post-test each year. Parents showed an increase in nutrition knowledge as a result of receiving information at home.

- In 2007, the gain was 32% with a 26% return rate.

- In 2008, the gain was 22% with a 56% return rate.

- In 2009, the gain was 24% with a 47% return rate.

Limitations

Although working in the school environment makes it easier to access students, it also has its challenges. School schedule changes sometimes meant that JBI classes were rescheduled. At times this made it more difficult for JBI personnel to deliver the program effectively.

The program was also limited in how it delivered and evaluated the parent outreach component. The delivery of parent newsletters and return of evaluations was dependent on children getting the resources from school to home and back to school again. JBI personnel saw the return rate for parent evaluations increase when students were encouraged to increase their efforts to take educational materials home to their parents and bring evaluations back to school.

Conclusions

Results of the statistical analysis of the data suggest that the JBI curriculum increased nutrition knowledge, fruit and vegetable intake, and physical activity for fifth graders. The JBI field trips resulted in an average nutrition knowledge increase of 44% for students. JBI parent outreach resources increased parent nutrition knowledge and reinforced concepts taught in-class.

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