

## **Be Active Kids: A Nutrition and Physical Activity Education Program for Four- and Five-Year-Olds**

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### **Abstract**

Be Active Kids is a nutrition and physical activity program for four- and five-year-olds. The program consists of a kit of educational materials designed for use in child care settings. The goal of the program is to give young children the tools they need to develop positive physical activity and healthy eating habits for a lifetime. The program emphasizes creative play and fruit and vegetable recognition. The Be Active Kids kit includes a curriculum notebook with fifteen leader lessons, a felt Food Guide Pyramid with a variety of foods, a felt story board with the Be Active Kids characters, food photo flash cards, classroom posters, family newsletter, and classroom video. Be Active Kids uses colorful characters, interactive hands-on lessons, and bright visuals to engage children in interactive learning. Be Active Kids can be used in a variety of settings including child care centers, family day care homes, and Head Start classrooms. Child care providers and teachers attend training to learn about implementation of Be Active Kids in their classrooms. Evaluation data indicate that Be Active Kids is being used in the classroom and is having a positive effect on children with respect to fruit and vegetable recognition and knowledge about healthy eating and physical activity.

### **Introduction**

Many risk factors for chronic diseases such as coronary artery disease and hypertension appear to begin in childhood (United States Department of Health and Human Services 1990). The American Pediatric Society recommends a diet high in fiber and moderate in fat (1992). The United States Department of Health and Human Services, United States Department of Agriculture, and National Cancer Institute each recommend the consumption of five fruits and vegetables per day for children and adults (United States Department of Health and Human

Services 1991; United States Department of Agriculture and United States Department of Health and Human Services 2000; National Cancer Institute 1986). Many children's diets, however, fall short of these recommendations. Recent reports indicate that only 6.8-20.0 percent of children eat five or more fruits and vegetables per day (Bash, Zybert, and Shea 1994; Krebs-Smith et al. 1996; Kann, Warren, and Harris 1995). Many children have diets that are too high in fat and low in fiber. (American Dietetic Association 1993; McDowell, Briefel, and Alaimo 1994). Eating habits are being formed throughout childhood. Research shows that positive attitudes toward healthy eating at an early age can go a long way toward developing lifelong positive eating patterns (Centers for Disease Control and Prevention 1997; Nicklas 1995; Kelder et al. 1994).

Physical activity is recommended for children to strengthen bones, decrease the risk of chronic health problems, decrease the risk of overweight and obesity, and increase the feeling of well-being (United States Department of Health and Human Services 1996). Many children, however, are not physically active. An increase in television viewing is associated with a decrease in physical activity and fitness levels in children (Armstrong et al. 1998). According to data from the North Carolina Governor's Council on Physical Fitness and Health, children in their study were less flexible, had a higher percent body fat and had poorer cardiovascular fitness than national standards (1992).

Approximately one in five children in the United States is now overweight (Troiano et al. 1995), with North Carolina children being twice as likely to be obese as children nationally. Overweight during childhood and adolescence is associated with overweight during adulthood (Guo et al. 1994). Treatment of adult obesity has overall been unsuccessful, thus prevention of obesity and overweight in our children is critical.

Environmental factors such as parental involvement, number of parents in the home and dual working families contribute to the nutritional status of our children (Nicklas 1995; McPherson, Montgomery, and Nichaman 1995). The American Dietetic Association and Society for Nutrition Education recommends that nutrition education begin early for all children (American Dietetic Association 1993; Crockett and Sims 1995). Studies indicate that parents and caregivers have a significant influence on children with respect to nutrition (Variyam et al. 1999; Contento, Balch, and Bronner 1995). With so many children attending child care from an early age, meaningful nutrition and physical activity education in this setting is paramount as our children form lifetime health habits. Reality-based experiences for young children to establish an early, positive orientation toward healthy eating and physical activity are needed.

Be Active Kids was developed to address the need for nutrition and physical activity education for four- and five-year-olds. The program consists of a kit of educational materials designed to be used in child care settings. Be Active Kids focuses on making physical activity and healthy eating fun. The program emphasizes creative play as well as improving fruit and vegetable

recognition. The program seeks to give young children the tools they need to develop positive physical activity and healthy eating habits for a lifetime. Be Active Kids uses colorful characters, interactive hands-on lessons, and bright visuals to teach children that healthy eating and being active can be fun.

## **Methods**

### **Kit Development**

Nutrition education and physical activity professionals developed the Be Active Kids kit. A twelve-person advisory committee guided the development. Subject matter experts in nutrition and physical activity, child development professionals, county field faculty, and child care professionals comprised the committee. The Be Active Kids kit consists of a notebook with fifteen leader lessons. Each leader lesson consists of a targeted nutrition or physical activity theme. Lessons are written to be developmentally appropriate, fun, and interactive, and are designed around teaching centers commonly found in the preschool classroom such as music, math, science, and make believe. Child care providers are given clear instructions on how the lessons can be easily modified so lessons can be repeated. The overall goal of the lessons is to promote positive attitudes toward physical activity and healthy eating. Also, included in the kit is a felt Food Guide Pyramid with a variety of foods, a felt story board with the Be Active Kids characters, food photo flash cards, classroom posters, classroom video, and a family newsletter.

Many of the activities in the Be Active Kids curriculum center around five adventurous animal characters. With these characters as their guides, children take an imaginary trip to the zoo, go on a picnic, tackle an obstacle course, make healthy snacks, and much more. "Ready, Set, Go with the Be Active Kids," a video designed to accompany the program, combines animation and live action. The video gives voice and movement to the Be Active Kids characters, making them come alive for the children. All Be Active Kids materials are housed in a compact container for easy storage in the classroom.

### **Dissemination of Be Active Kids**

Be Active Kids employs the "train-the-trainer" model for dissemination. Family and Consumer Education Agents (Agents) participating in Be Active Kids attend a daylong train-the-trainer session. To expand efforts and resources, Agents select a partner to attend the training who would be willing to help implement the program at the local level. Agents form partnerships with a variety of agencies including child care resource and referral; health department; 4-H; and Women, Infants and Children (WIC). These partnerships afford Agents an opportunity to collaborate for greater community impact. The daylong training consists of subject matter information on nutrition and physical activity for four- and five-year-olds, detailed discussion of

the Be Active Kids kit and all its components, demonstration of several of the Be Active Kids activities, and information on implementation at the local level. Agents and partners are also given education and encouragement with respect to their own nutrition and physical activity as they serve as role models in the community.

Agents and their community partners then offer local training for child care providers working in child care centers, family day care homes, Head Start classrooms, or other facilities serving four- and five-year-olds. Local trainings target child care providers who serve limited resource children. Child care providers who attend this comprehensive three to four-hour training receive a Be Active Kids kit at no charge. Be Active Kids provides family day care homes, child care facilities, and Head Start classrooms serving limited resource children with high quality materials to address healthy eating and physical activity. Many of these sites have providers that lack the training and or materials to teach young children about healthy eating and being active. Trainings are designed to provide skills, knowledge, and materials to make Be Active Kids come alive in the classroom. Local trainings are offered on Saturdays and evenings to accommodate child care providers' schedules.

## Evaluation

Be Active Kids used a three-phase evaluation strategy to assess effectiveness of the program. Phase One consisted of training evaluations collected from each child care provider attending a local training. These evaluations were used by the Agent to adapt local trainings to suit the needs of the attendees. Phase Two evaluation was an eight-week follow-up survey sent to child care providers attending a Be Active Kids training. This survey was designed to assess the usage of Be Active Kids in the classroom and plans for future use of the materials. The survey was pre-tested for clarity by the target population and revised accordingly. Agents participating in this phase of the evaluation collected names and addresses from each participant, asked for their cooperation in assisting with the eight-week evaluation, and explained why these data were being collected. Agents asked for an address where participants can personally receive mail (this may not be the child care center). Surveys were mailed eight weeks after local training along with a self-addressed, stamped envelope. This phase of the evaluation was conducted using child care providers who attended trainings during the first six months of the program.

The final phase of the Be Active Kids evaluation was the individual child interviews. Five child care centers were identified by the Wake County Agent who had participated in the Be Active Kids program (experimental group); the Agent also identified three centers that had not participated in the training to serve as the control. Child care centers in the experimental group were contacted to ascertain if they would participate in this phase of the evaluation. They all agreed, as did the control child care facilities. An expert in early childhood education (Interviewer) conducted all child interviews. The interview protocol was tested with a group of

children in another county for clarity and acceptability by the population and modified as appropriate. The Interviewer contacted the participating child care centers to introduce herself, go over the protocol, and set up appointments for interviews at the center, where she secured a quiet room without distractions. All interviews were tape-recorded as well as hand tabulated by the Interviewer on preformatted sheets.

Children were escorted to the study area one at a time to participate in the interviews. Each interview lasted approximately fifteen minutes. The Interviewer asked a few icebreaker questions and then proceeded. Several open-ended study questions were asked of each child:

- Can you name some healthy foods?
- What are some things we can do to keep our bodies healthy?
- Can you tell me or show me some ways we can be physically active?

The children were then asked to help the Interviewer identify some foods that she had brought in a brown paper grocery bag. Before the interview, ten randomly selected fresh, whole fruits and vegetables were placed in the bag. The fruits and vegetables in the bag were from the list of 23 fruits and vegetables discussed in the Be Active Kids program. Cardboard cut-outs of a smiling and frowning face were placed on the floor. One at a time, the Interviewer removed a food from the bag and handed it to the child. The Interviewer asked, "Do you know what this is?" The child's answer was recorded. If the answer was correct, the Interviewer asked if the child liked the food. The child was then requested to place it on a smiling face if "yes" and frowning face if "no." If the child did not know the food or gave an incorrect answer, the Interviewer told the child what it was and asked "do you think you would want to try this food?." The food was then placed in another bag out of sight. This was repeated until all 10 foods were removed from the bag. The paper bag exercise was used to ascertain fruit and vegetable recognition as well as interest in trying new and unknown foods.

## **Results**

### **Numbers Trained**

In year one of the Be Active Kids program ten Agents representing ten counties participated in the train-the-trainer session and locally trained over 800 child care providers. In its second year, Be Active Kids grew to 38 participating counties that trained more than 1,000 child care providers. In its third year (current year), Be Active Kids is in 64 counties and has trained more than 1,500 child care providers to date.

### Eight-Week Follow-Up Survey

Responses to the eight-week follow-up survey (n=72, response rate=59 percent) indicate that the Be Active Kids kits are being used; the materials provided useful teaching tools, and providers will continue to use the kits in the future. When asked if they felt Be Active Kids increased the children's knowledge about healthy eating and physical activity, they responded "yes" at a rate of 90 percent and 85 percent, respectively. They also indicated that using Be Active Kids increased the physical activity of the children (90 percent) and that they saw positive changes with respect to healthful eating (76 percent). Ninety-six percent of child care providers surveyed indicated that using the Be Active Kids program positively changed their attitude about the importance of teaching children about physical activity and healthy eating. Anecdotal follow-up by agents and community partners echoed the findings of the eight-week follow-up evaluation. Many child care centers that have had teachers participate in the training are requesting additional training for all of their teachers. Also, Head Start has requested special training for their teachers in several counties. Following are several quotes from child care providers using Be Active Kids in their classroom.

- "The children I teach are more willing to try new foods."
- "We talk about healthy foods while we are eating."
- "The children are more into games with movement."
- "The children are even preferring the healthy snacks. They like to remind me that these are good for their bodies."
- "If the Be Active Kids like it, the children will try it. I serve things new every week and they always try it."

### Child Interviews

Results of the child interviews are presented in Table 1. Data were analyzed using the SPSSX statistical analysis package. Data were analyzed using descriptive statistics, one-way analysis of variance, and one-tailed t-tests as appropriate for the sample size and question being analyzed. Children participating in Be Active Kids (n=100) recognized significantly more fruits and vegetables than children in the control group (n=54) ( $p<.05$ ). The emphasis on fruit and vegetable recognition using flash cards and the felt Food Guide Pyramid helped children participating in Be Active Kids be familiar with a wide variety of fruits and vegetables. Children participating in Be Active Kids were also more likely to be able to name at least three healthy foods ( $p<.05$ ). A great deal of flexibility was used when qualifying foods as healthy or

unhealthy. Any food in the fruit, vegetable, grain, milk, or meat group was accepted as healthy. Foods like Pop Tarts™, fried chicken, candy, soft drinks, or fruit drinks were not classified as healthy for our purposes. Children participating in Be Active Kids could more often mentioned healthy eating and physical activity when describing something that help makes people healthy ( $p<.05$ ). Compared to the control group, significantly more ( $p<.05$ ) of the children participating in Be Active Kids understood what physical activity was or could show the Interviewer by moving their bodies in place or moving around the room. Children in the control group often simply responded "no" to the question "Can you tell me or show me some ways we can be active?"

### **Application**

Be Active Kids represents a unique model for programming at the local level that may be able to be duplicated by others. The kit given to child care providers is high quality, easy to use, innovative, and fun. It is the training component, however, that we believe makes the program so successful. So often child care providers have little or no resources to purchase materials for use in the classroom. Materials they receive may be incomplete and may not provide everything they need to carry out the educational opportunity. Many child care providers do not have the background or skills to develop lessons or create appropriate educational opportunities with respect to nutrition and physical activity. They may also not be aware of the importance of starting early in a child's life to develop proper eating and physical activity habits. The training component of the Be Active Kids program provides the child care providers with hands-on practice in using the Be Active Kids program. When they return to their child care settings, they do not have to prepare or buy additional materials. The Be Active Kids kit is complete, allowing them to begin immediately. This hands-on approach helps insure that the materials are used and do not sit on the shelf. With so many of our children spending so much time in child care, it is imperative that we provide those working in child care settings with the needed resources and training to begin to educate young children about healthy eating and physical activity.

### **Acknowledgements**

We would like to thank all the Family and Consumer Education Agents and their community partners who worked diligently to make Be Active Kids a success. Thanks to the NC Nutrition Network and Economic Independence Services Section, Division of Social Services, NC DHHS and Food & Nutrition Services, USDA, and Blue Cross and Blue Shield of North Carolina for funding Be Active Kids.

Table 1. Be Active Kids Child Interview Results

Question/Variable	Experimental n=100	Control n=54
<b>Gender</b>	45% female 55% male	50% female 50% male
<b>Age</b>	4.44+/- .61	4.50 +/- .5
<b>Ethnicity</b>	50% African American 40% Caucasian 1% Native American 2% Hispanic 7% Other	19% African American 74% Caucasian 2% Hispanic 6% Other
<b># fruits and vegetables recognized</b>	6.9 +/- 1.95*	4.93 +/-2.23
<b>% not recognized but willing to try</b>	63.7% +/-39%	60% +/- 30.9%
<b>Name something that makes you healthy</b>	20% didn't mention PA** or nutrition* 32% mentioned nutrition 15% mentioned PA 33% mentioned PA and nutrition	68% didn't mention PA or nutrition 30% mentioned nutrition 2% mentioned PA
<b>Could name at least 3 healthy foods</b>	94%*	46%
<b>Understood what physical activity was</b>	92% yes* 1% no 7% incomplete picture	17% yes 65% no 19% incomplete picture

\* p&lt;.05

\*\* Physical Activity

## References

American Academy of Pediatrics, Committee on Nutrition. 1992. Statement on cholesterol. *Pediatrics*. 90:469-473.



American Dietetic Association. 1993. Position of the American Dietetic Association: child nutrition series. *Journal of the American Dietetic Association*. 93:334-336.

Armstrong, C.A., J.F Sallis, J.E. Alcaraz, B. Kolody, and T.L. McKenzie. 1998. Children's television viewing, body fat, and physical fitness. *American Journal of Health Promotion*. 12(6):363-368.

Basch, C.E., P. Zybert, and S. Shea. 1994. 5-A-Day: Dietary behavior and the fruit and vegetable intake of Latino children. *American Journal of Public Health*. 84:814-818.

Centers for Disease Control and Prevention. 1997. Guidelines for school health programs to promote lifelong healthy eating. *Journal of School Health*. 67(1):9-26.

Contento, I., F.I. Balch, and Y.L. Bronner. 1995. Nutrition education for school-aged children. *Journal of Nutrition Education*. 27:298-311.

Crockett, S.J., and L.S. Sims. 1995. Environmental influences on children's eating. *Journal of Nutrition Education*. 27:235-249.

Guo, S.S., A.F. Roche, W.C. Chumlea, J.D. Gardner, and R.M. Siervogel. 1994. The predictive value of childhood body mass index values for overweight at age 35 years. *American Journal of Clinical Nutrition*. 59:810-819.

Kann, L., C.E. Warren, and W.A. Harris. 1995. Youth Risk Behavior Surveillance United States, 1993. *Morbidity and Mortality Weekly Report*. 44(ss-1:13).

Kelder, S.H., C.L. Perry, K.I. Klepp, and L.L. Lytle,. 1994. Longitudinal tracking of adolescent smoking, physical activity, and food choice behaviors. *American Journal of Public Health*. 84:1121-1126.

Krebs-Smith, S.M., A. Cook, A.F. Subar, L. Cleveland, J. Firday, and L.L. Kahle. 1996. Fruit and vegetable intakes of children and adolescents in the United States. *Archives of Pediatric and Adolescent Medicine*. 150:81-86.

McDowell, M.A., R.R. Briefel, and K. Alaimo. 1994. Energy and macronutrient intakes of persons ages 2 months and over in the United States: Third national health and nutrition examination survey, phase 1 1988-1991. *Vital and Health Statistics, No. 255*. Hyattsville, MD: National Center for Health Statistics.

McPherson, R.S., D. H. Montgomery, and M.Z. Nichaman. 1995. Nutrition status of children: what do we know? *Journal of Nutrition Education*. 27:225-234.

National Cancer Institute. 1986 Cancer control objectives for the nation: 1985-2000. NIH Publication No. 86-2880. No. 2. Washington, DC: United States Government Printing Office.

North Carolina Governor's Council on Physical Fitness and Health. 1992. Children and youth fitness study. Unpublished data.

Nicklas, T.A. 1995. Dietary studies of children: the Bogalusa heart study experience. *Journal of the American Dietetic Association*. 95:1127-1133.

Troiano, R.P., K.M. Flegal, R.J. Kuczmarski, S.M. Campbell, and C.L Johnson. 1995. Overweight prevalence and trends for children and adolescents. The NHANES Surveys 1963-1991. *Archives of Pediatrics and Adolescent Medicine*. 149:1085-1091.

United States Department of Agriculture and United States Department of Health and Human Service. 2000. Nutrition and your health: Dietary guidelines for Americans. Home and Garden Bulletin No. 232. Washington, DC: United States Department of Agriculture and United States Department of Health and Human Services.

United States Department of Health and Human Services. 1996. Physical Activity and Health: A Report of the Surgeon General. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Chronic Disease and Prevention and Health Promotion.

United States Department of Health and Human Services. 2000. Healthy People 2010. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: United States Government Printing Office.

Variyam, J.N., J. Blaylock, B.H. Lin, K. Ralston, and D. Smallwood. 1999. Mother's nutrition knowledge and children's dietary intakes. *American Journal of Agriculture Economics*. 81(2).

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**Editor's Note:** Dr. Dunn was recently selected to join NC State University's Academy of Outstanding Faculty Engaged in Extension. The Academy recognizes faculty members who demonstrate commitment and excellence in extension and engagement work.

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**Cite this article:**

Dunn, Carolyn, Cathy Thomas, Christine Smith, and Leslie Pegram. 2001. Be Active Kids: A nutrition and physical activity education program for four- and five-year-olds. *The Forum for Family and Consumer Issues* 6(3).