

Smart Bodies

Submitter's Contact Information

Mark Tassin, Ph.D.
4-H Department Head, 4-H Youth Development
LSU AgCenter
169 Knapp Hall, Baton Rouge, LA 70803
Email: [MGTassin@agcenter.lsu.edu](mailto:MG_Tassin@agcenter.lsu.edu)
225-578-2196 (phone)
225-578-2478 (fax)

Ellen Murphy, Ph.D.
Smart Bodies Principal Investigator, FCS State Program Leader and
Associate Director of the School of Human Ecology
LSU AgCenter
School of Human Ecology, Baton Rouge, LA 70803
Email Address: EMurphy@agcenter.lsu.edu
225-578-0485 (phone)
225-578-4443 (fax)

Denise Holston, MS, LDN, RD
Smart Bodies Program Coordinator
LSU AgCenter
276 Knapp Hall, Baton Rouge, LA 70803
Email: DHolston@agcenter.lsu.edu
225-578-4573 (phone)
225-578-4443 (fax)

Georgianna Tuuri, PhD, LDN, RD
Principal Investigator, Smart Bodies research, Assistant Professor
Louisiana State University, School of Human Ecology
School of Human Ecology, Baton Rouge, LA 70803
Email: gtuuri@lsu.edu
225-578-1722 (phone)
225-578-4443 (fax)

Program of Distinction Category

- Healthy Lifestyles: Youth Obesity, Nutrition Education, Health and Fitness, Safety, Healthy relationships, Good decisions

Sources of Funding that Support this Program

The primary and most substantial funding for the program is from Blue Cross and Blue Shield of Louisiana Foundation (\$1.8 million over 5 years). Other funding entities include: the Louisiana Food Stamp Nutrition Education (FSNE) Program—Family Nutrition Program (\$75,000), the Pennington Family Foundation (\$25,152) and the National Center for Family Homelessness (\$73,000).

Program Content

Knowledge and Research Base

According to the former United States Surgeon General, Dr. Richard Carmona, "We may see the first generation that will be less healthy and have a shorter life expectancy than their parents." This statement was made as a result of the startling increase in childhood obesity rates over the past two decades (United States Department of Health and Human Services [USDHHS], 2003). Nationwide, the childhood obesity rates for children of all ages has increased from 4% in 1971 to almost 17% in 2004. Additionally, another 16% were considered at risk of overweight. An alarming rate of 37% of elementary school-age children are either overweight or at risk of being overweight (Ogden, 2006).

Little published data is available on the childhood obesity rates in Louisiana. One statistic from an unpublished study in New Orleans found that 31% of children between the ages of 6-14 were overweight or obese (Carlisle, Gordon, Sothern, 2005). Other reports have shown that prevalence of overweight or obesity in high school students in Louisiana range from 13-16% (Action for Healthy Kids [AFHK], n.d.).

Childhood obesity rates are of particular concern because children who are overweight or obese are 70% likely to be overweight or obese as an adult. Being overweight or obese substantially increases a person's risk for the development of nutrition-related chronic diseases such as cardiovascular disease, type 2 diabetes, some forms of cancer, stroke, sleep apnea, hypertension, and osteoarthritis (Centers for Disease Control [CDC], n.d.). Further, pediatricians are reporting an increase in the number of overweight children who are being diagnosed with "adult diseases" such as type 2 diabetes (Ludwig & Ebbeling, 2001). This is of great concern because a diagnosis of type 2 diabetes further increases the risk for cardiovascular disease, stroke, and kidney disease (Must & Anderson, 2003).

Poor dietary habits and lack of physical activity are major controllable contributing factors to overweight and obesity in children. According to Gleason and Suitor (2001), only 14% and 20% of children from 6-19 years of age consumed 2-4 servings of fruit and 3-5 servings of vegetables per day respectively. Further, children are now consuming less milk and more beverages with added sugars such as soda and fruit drinks. Low fruit, vegetable and milk consumption may be a result of the startling increase in fast food consumption among children (American Heart Association [AHA], 2005).

Lack of physical activity has also been recognized as another contributing factor to the current child and adult obesity rates. Data from the 1999-2001 National Health Interview Study indicate that 61.5% of children aged 9-13 years do not participate in any type of organized physical activity outside of school and 22.6% fail to participate in free-time activity (CDC, 2002). Opportunities for physical activity in school are also limited. In the School Health Policies and Programs Study, only 8% of elementary schools nationwide provide daily physical education classes to students throughout the year (Burgeson, Wechsler, Brener, Young, & Spain, 2001).

Because it is estimated that over 55 million children attend public and private schools in the United States, schools have been identified as a key component to the prevention of childhood obesity (Institute of Medicine [IOM], 2005). To further support this concept, in 2004 the Federal Government enacted the Child Nutrition and WIC Reauthorization Act, which requires all school systems participating in the National School Lunch and Breakfast Program to establish and implement school wellness policies by the start of the 2006 school year. Wellness policies for each school district must be developed to address the following: nutrition and physical activity goals, nutritional guidelines for foods, and plan for evaluation (AFHK, 2006).

Needs Assessment

Obesity is a growing healthcare problem in Louisiana, and carries with it significant costs, both in terms of dollars and lives. Because Louisiana has one of the highest poverty rates in the nation and an estimated 23% of children in the state live in poor families, combating the epidemic is crucial, but difficult (Fass & Cauthen, 2005). In order to reduce the prevalence of overweight/obesity in Louisiana, it is essential that we teach younger children to adopt healthy behaviors now, before unhealthy habits are established.

The prevalence of overweight/obesity in children can be confronted through comprehensive health programs designed to educate and change behaviors in a variety of settings, beginning with the classroom and in the home. To accomplish this, several public health agencies, such as the Institute of Medicine, have encouraged the establishment of public-private partnerships (IOM, 2006). Accordingly, in the planning stages, the LSU AgCenter sought and established a public-private partnership with Louisiana's largest health insurer, BCBS. After the partnership was established, various school-based nutrition education and physical activity curricula and programs were reviewed and evaluated (curricular components of Smart Bodies are described later in this paper). Based on the successes of the Delta HOPE (Healthy Options for People through Extension) Tri-State Initiative, Smart Bodies was formed as a signature three-part comprehensive nutrition education and physical activity program for elementary schoolchildren. An additional component, the Body Walk, was added to create a more interactive, learned-centered educational experience.

Curricular materials utilized in Smart Bodies address both nutrition education and physical activity; therefore, schools in Louisiana can use the curricula in the program to fulfill mandates set forth by the 2004 Child Nutrition and WIC Authorization Act. Because the mandate did not establish provisions for funding to support implementation or evaluation of wellness policies, the Smart Bodies Program provides schools and teachers with needed resources at no cost to improve eating habits and increase nutrition knowledge and physical activity levels of elementary students.

Over the years, the commitment of schools to provide students with appropriate, regular physical activity has decreased dramatically. As a result, the Louisiana legislature passed a law which requires public schools to provide students

in kindergarten through 6th grade with a minimum of 30 minutes per day of moderate to vigorous physical activity. One component of Smart Bodies, Take 10! helps schools meet this legislative mandate (Act No. 734). Studies have also demonstrated that even one hour of additional physical activity per week among children will impact the incidence of overweight or obesity (National Institute for Healthcare Management Foundation [NIHCMF], 2003). By performing one Take 10! daily, students will receive a minimum of 50 minutes of additional, quality, physical activity each week.

Program Goals and Objectives

The overall goal of the Smart Bodies Program is to promote lifelong healthy eating patterns and physically active lifestyles to Louisiana's children and their families.

The objectives of the program are to have children:

- Increase basic nutrition knowledge
- Understand importance of physical activity
- Increase time spent in physical activity
- Increase intake of fruits and vegetables in the diet
- Learn more about the digestive system of the human body

Target Audience

The target audience for the Smart Bodies Program includes public or private elementary schools in Louisiana and their students in grades K-5 with emphasis on limited income youth. Participating schools' administrators, faculty, and parents/guardians are served indirectly through the program by receiving monthly newsletters, Body Walk activity books, and the OWG and Take 10! curricula. Parents/guardians also have the opportunity to volunteer and participate in the Body Walk when it visits their child's school. Schools can only participate in the program if they agree to implement curricula contained within Smart Bodies for a minimum of 12 weeks. In 2005 and 2006, 157 schools and 68,158 children participated in the program.

Type of Program

Smart Bodies is a 4-H youth enrichment program. Smart Bodies is an innovative program of nutrition and physical activities that is integrated into core curriculum academics to promote child wellness. Smart Bodies targets children in grades K-5 and integrates classroom activities with hands-on learning to teach children how to build strong bodies and active minds. Smart Bodies consists of three components: Body Walk, the OrganWise Guys (OWG), and Take 10!

Delivery Methods

- Louisiana Cooperative Extension, Family and Consumer Sciences (FCS), and 4-H field agents (all will be referred to as LSU AgCenter agents) conduct Smart Bodies teacher trainings with participating schools shortly before the school year begins.
- In the fall, the program "kicks off" when the local AgCenter agent organizes and executes a 30-minute interactive school assembly for grades K-2 and 3-

5 to introduce the OWG and build excitement and enthusiasm for the Body Walk, OWG and Take 10!(See Pictures 4 & 5 in Appendix).

- After the assembly, the teachers then implement the Take 10! and OWG activities within their classrooms to promote wellness and healthy eating habits.
 - More specifically, teachers and their students watch one OWG video per month, read one OWG book per week, perform one Take 10! activity per day, and track fruit and vegetable consumption and Take 10! activities on supplied posters.
- During the 12 week implementation period, the Body Walk will arrive at the school. During the Body Walk, the students tour the body as a food and participate in hands-on activities in each “organ”, which enables them to understand the effect that different foods and health behaviors have on each organ. The educational activities within each station are facilitated by volunteers. At the end of their tour, each student receives a Body Walk activity book to complete with their families.
 - The inside cover of all Body Walk activity books contain a full-page advertisement for 4-H to facilitate student enrollment.
- After the Body Walk leaves, the teachers will continue to implement the OWG and Take 10! activities.
- Monthly-themed newsletters with physical activity tips (family fun) and kid-friendly recipes emphasizing fruits and vegetables are sent home to parents/guardians or posted on school websites.
- Schools receive a “We’re a Smart Bodies School” yard sign branded with logos and the website address to display in the front of the school and to create awareness among parents and community members.
- LSU AgCenter agents frequently visit schools to monitor adherence to the program by checking both the fruit and vegetable and Take 10! tracking posters displayed in classrooms.
- Teachers and students receive educational incentive items (with health messages) to encourage continuous participation. Incentive items include magnets, stickers, water bottles, bookmarks, pedometer, pencils, rulers, and notepads.

Curricula and Educational Materials

- **The Body Walk** is a 35-foot by 45-foot walk-through exhibit representing the human body. Students explore the brain, mouth, stomach, small intestines, heart, lungs, muscles, bones, and skin stopping at learning stations to participate in interactive activities focused on the effects that the food has on each organ. Students also receive a take-home activity book to share with their families (See Pictures 1& 2 in Appendix).
- **The OWG** are fun characters that help children understand physiology and healthy behaviors through books, games, dolls and informational videos. Each participating school receives a **free healthy school kit** with eight videos, Little Organ Annie and Andy dolls, books, games and puzzles, and Take 10! activities. The OWG curriculum was the winner of the 2005 Innovation in Prevention Award (See Picture 3 in Appendix).

- **The Take 10! Classroom Program** is a grade-specific educational tool that encourages short bouts of physical activity integrated with academic lessons. Activities provided in both the Take 10! and OWG curricular materials are linked to the grade-level expectations (GLEs) established by the Louisiana Department of Education. In combination with the OWG, Take 10! received a gold rating (the highest) by the Cooper Institute in 2005.
- Parent newsletters are monthly themed and include tips for incorporating physical activity into family life and kid-friendly, low-cost recipes emphasizing fruits and vegetables.
- Marketing and educational incentive materials were designed by the LSU AgCenter Communications faculty. Items include magnets, water bottles, pedometer, stickers, and exhibits. Each item contains nutrition messages such as “low-fat, high fiber, lots of water, exercise!” or promotes the Smart Bodies website (www.smartbodies.org)

Teamwork and Collaboration

At the state administration level, the Smart Bodies team consists of a grant principal investigator, a program coordinator, a Body Walk manager, a research associate, and two faculty members from the LSU of Human Ecology and Department of Kinesiology. Over 90 LSU AgCenter agents in 52 of 64 parishes in Louisiana have implemented the program at the parish-level.

Other Collaborators:

- Blue Cross and Blue Shield of Louisiana participates in an ongoing marketing campaign with the intention of promoting child wellness and healthy behaviors and helps to establish BCBS and the LSU AgCenter as leaders in child wellness and health promotion.
- School board officials, administrators and faculty in 52 parishes have been supportive of the program and have implemented or will implement the program by Fall 2007.
- The American Dental Association has provided dental kits for students.
- Area banks, grocery stores, and restaurants have provided healthy snacks for students and parents who volunteer for the Body Walk.

The following organizations have provided volunteers to assist schools with the Body Walk:

Baton Rouge General Hospital, LSU (College of Agriculture, Collegiate 4-H, Department of Education, School of Human Ecology, Student Dietetic Association) Jefferson Parish School System ROTC, East Baton Rouge Parish Volunteer Fire Department, BCBS “Blue” Volunteers, CHRISTUS Schumpert Health System, Southern University, and Southeastern Louisiana State University

The following organizations have endorsed or promoted the program via websites, invitations to present at conferences and/or meetings, and presentation of awards:

The Advocate (newspaper-editorial), the Baton Rouge Dietetic Association, the Louisiana Department of Education, the Louisiana Department of Health and Hospitals (Lighten Up Louisiana), KATC TV3 (What's right with Acadiana), Louisiana Association for Health, Physical Education, Recreation and Dance (LAPHERD), the Louisiana Dietetic Association, the Louisiana Obesity Council, and the Society of Nutrition Education.

Research results have been presented at the following conferences:

21st Century Families Conference, the American College of Sports Medicine, the American Dietetic Association (accepted, will be presented 2007 conference), the Obesity Society (NAASO), and the Society of Nutrition Education.

Media Exposure:

Since the program launched in March 2005, over 164 articles have been published in newspapers and magazines and there have been 12 television and 1 live radio broadcasts.

Program Evaluation

Methods

Evaluation of the Smart Bodies Program includes the following:

1. A 6-month pilot study was conducted to assess the design and instrumentation of the program. Only 4th and 5th grade students (with parental consent) in each of the four pilot schools were include in the investigation. Students' heights and weights were measured to determine the number of children who were overweight or at-risk of becoming overweight (based on BMI-for-age percentiles). Surveys were administered to assess students' nutrition and physical activity knowledge and attitudes. Physical activity duration and intensity were measured using accelerometers.
2. Assessment using focus group discussions was used to determine if the program addressed the professional and educational needs, concerns, and motivations of those who actually implement the program - the teachers. Questions used in the FGD were based on the PRECEDE/PROCEED theoretical model.
3. A 2-year formal research project was to evaluate the effectiveness of Smart Bodies in promoting child wellness and preventing childhood obesity. Students completed surveys before and after the 12-week program. A subsample of students wore activity monitors on their wrists for seven days before and after the program to evaluate physical activity objectively. Heights and weights were also measured, and Body Mass Index-for-age percentile health reports were generated and given to the school principals and mailed home to parents of students in the intervention group. A random sample of parents from both groups was asked to complete a brief questionnaire.

Process Evaluation

When the public-private partnership between the LSU AgCenter and BCBS was formed, performance goals for the program were established. Specifically, each year at least 50 schools and 30,000 children must participate in the Smart Bodies Program. In 2005, 56 schools and 31, 548 children in 21 parishes participated in the program. Through additional funding, 101 schools and 37,000 children in 32 parishes participated in the program. By the end of 2007, schools in 52 of the 64 parishes are projected to have participated in Smart Bodies.

Outcome Evaluation

The two-year formal investigation (listed above in "Methods") was conducted among 14 elementary schools in East Baton Rouge Parish. Schools were stratified based upon school size (student enrollment), the number of students receiving free and reduced price lunch, and state school performance score¹. After schools were clustered, they were pair-matched and then randomly assigned to a treatment (intervention) or control group. Only fourth and fifth grade students with parental consent were included in the research.

The primary goals of the research project were: (1) to increase consumption of fruits and vegetables served at school, (2) increase nutrition and physical activity knowledge and willingness to participate in physical activity, (3) increase parent awareness of their child's weight status, and (4) to decrease the number of students in the at risk for overweight or overweight categories. Analysis of the formal research data suggests that:

Objective 1: Fruits and vegetables

- Students participating in Smart Bodies significantly increased their knowledge about the health benefits of eating fruits and vegetables ($p < .05$).

Objective 2: Physical Activity

- Analysis of the variables related to physical activity suggests that the Smart Bodies intervention did have a positive effect on children's knowledge about physical activity. Using a pre-post test design, as compared to the control group, children who participated in the Smart Bodies program increased their knowledge about the effects and benefits of physical activity ($p < 0.05$).
- During this project, we were able to assess activity levels on a small subsample of children by using accelerometers to assess their physical activity levels over the course of one week. The analysis of the pre-post test data revealed a trend suggesting that the children who experienced the Smart Bodies intervention had higher overall physical activity levels than those who did not [$F(1, 56) = 2.97, p = .09$]. Additionally, there was clear evidence that children had higher activity counts during Take 10! than at lunch, during physical education lessons, and during after school hours,

¹ School performance score was calculated by using one year of assessment data from the Louisiana Educational Assessment Program (LEAP) test, and two years of attendance and dropout data. Based on these data, schools received a performance label ranging from "five stars" (highest) to "academically unacceptable" (lowest).

supporting the premise that incorporating Take 10 bouts during the school day is a viable means to increase children's overall levels of physical activity.

Objective 3: Parent and School Awareness of Child's BMI Status

- Body Mass Index health reports were effective in increasing both school and parent awareness of children's weight status. Parents of 40 children who had been randomly selected from each of two weight categories (Healthy Weight & At Risk/Overweight) were mailed a BMI report and compared to parents who did not. After receiving the report, parents were 4.5 times more likely to accurately identify their child's weight category. Parents of at risk or overweight children had increased concern while those of healthy weight children expressed less concern compared to parents without access to the report.

Objective 4: Children's Weight Status

- One-year follow-up measurements of heights and weights were conducted in April of 2007 to assess whether the prevalence of overweight among the cohort has declined and is currently being analyzed.
- Preliminary results (baseline data) showed:
 - 36.92% of children in the control group were overweight or at risk of becoming overweight.
 - 39.53% of children in the intervention group were overweight or at-risk of becoming overweight.

Communication to Stakeholders

Program outcome information has been reported annually to the LSU AgCenter through impact reports on the AgCenter reporting system. These reports are also made available to the public. Annual reports and formal presentations are also made to funding agencies.

Press releases are annually distributed statewide to all media affiliates in Louisiana. Local LSU AgCenter agents also distribute local press releases when the program is implemented in their parish. As a result, since Smart Bodies was launched in March 2005, over 161 newspaper and magazine articles have been published and 10 television reports and 1 radio broadcast have aired.

Findings from the formal research have been presented at several local, state and national conferences, including: the 21st Century Families, the American College of Sports Medicine, the American Dietetic Association (accepted, will be presented in September 2007), the Baton Rouge Dietetic Association, the BCBS Association Marketing Conference, the Society of Nutrition Education, the Louisiana Association for Physical Education and Recreational Dance, the Louisiana Department of Education, and the Obesity Society (NAASO). The Louisiana Dietetic Association has also recognized BCBS for their contribution to child wellness.

Local legislators, school board members, and community members receive updates on the program from local LSU AgCenter agents during advisory committee meetings, school board meetings, and school in-service trainings. All school

superintendents received program and research updates at the 2007 School Superintendent's Breakfast sponsored by 4-H.

Blue Cross and Blue Shield of Louisiana representatives communicate information about the program to current and potential policyholders through their website, newsletters, phone advertisements, and enrollment seminars.

Evidence of Sustainability

Schools who participate in Smart Bodies are able to keep all curricular materials even after their 12 week commitment period ends. Because all curricular materials in Smart Bodies have been linked to content standards and benchmarks mandated by the Louisiana Department of Education, teachers can easily incorporate Smart Bodies curricular materials as part of their core academic learning objectives. Further, several school systems have adopted and/or utilized the Smart Bodies Program as part of their school wellness policy. Numerous teachers from participating schools have mailed "thank you" letters and samples of student work which demonstrate how concepts in the Smart Bodies Program are applied to other academic areas. Over 100 students have mailed pictures and letters expressing how they have applied concepts learned through the Smart Bodies Program to their daily lives.

Replicability

In addition to funding secured from BCBS, other charitable organizations have contributed funds to enable additional schools to receive the Smart Bodies Program. The program grew from just over 50 schools in 2005 to over 100 schools in 2006 and a projected enrollment of approximately 100 new schools in 2007. By the end of 2007, the program is expected to have expanded (based on pre-enrollment) to schools in 52 of the 64 parishes in Louisiana.

The design and implementation protocol for Smart Bodies has been evaluated and can easily be utilized and applied to school-based programs in other states.

Rationale and Importance of Program

Obesity rates among children and adults are increasing at an alarming rate. Poor dietary practices and physical inactivity are the main contributors; therefore, it is important to empower young children with the knowledge needed to establish preventative health behaviors. This can be accomplished through a comprehensive school-based nutrition education and physical activity program that is both educational and entertaining. A formal research project has demonstrated that participation in the Smart Bodies Program has increased students' nutrition and physical activity knowledge, physical activity levels and willingness to consume fruits and vegetables.

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Appendix

Picture 1: The Body Walk



Picture 2: Students holding Body Walk activity books after touring the exhibit



Picture 3: Children utilizing OrganWise Guys materials



Picture 4: 4-H Agent conducting OrganWise Guys school assembly



Picture 5: FCS Agent conducting OrganWise Guys school assembly



Figure 1: Data from activity monitors indicated that students were more active when participating in a Take 10! activity than during PE, lunch, recess, and after school

