EVALUATION OF ALABAMA PUBLIC SCHOOL WELLNESS POLICIES AND

STATE SCHOOL MANDATE IMPLEMENTATION

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EVALUATION OF ALABAMA PUBLIC SCHOOL WELLNESS POLICIES AND STATE SCHOOL MANDATE IMPLEMENTATION

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STATE SCHOOL MANDATE IMPLEMENTATION

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VITA

Alisha Beth Gaines, daughter of Judson and Miriam Gaines, was born May 3, 1983, in Montgomery, Alabama. Alisha graduated with honors from Edgewood Academy in Elmore, AL, in 2001. She attended The University of Alabama where she completed the Coordinated Program in Dietetics and received her Bachelor of Science degree in Food and Nutrition in December, 2005. In January, 2006, she entered the graduate program in the Department of Nutrition and Food Science at Auburn University where she pursued a Master of Science degree under the direction of Dr. Sareen Gropper.

THESIS ABSTRACT

EVALUATION OF ALABAMA PUBLIC SCHOOL WELLNESS POLICIES AND STATE SCHOOL MANDATE IMPLEMENTATION

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Wellness policies from 91 of 131 (69%) Alabama (AL) public school systems were compared to federal guidelines required by the Child Nutrition and WIC Reauthorization Act of 2004. To assess the school food and nutrition environment, data were analyzed from 123 (94%) school system superintendent surveys regarding compliance with/implementation of school food and nutrition mandates issued by the Alabama State Department of Education (ALSDE) in 2005. School systems were evaluated (graded) based on the percentage of seven federal components addressed in the individual wellness policies. A second percentage grade was issued based on the percentage of ALSDE mandates completed. The majority of school systems (71%) were in full compliance with all federal wellness policy requirements. On average, school

systems addressed 6.4 of the 7 components, for a mean percentage grade of 92%. Physical activity was the most frequently addressed component (99%), while evaluation of the wellness policy (80%) and identification of a party responsible for evaluation (79%) were the least addressed components. Mean implementation of ALSDE food and nutrition mandates was 79%. Only nine of 123 systems (7%) indicated completion of all ALSDE mandates. Creation of a wellness policy and positive changes in cafeteria menus were the most commonly implemented mandates, and use of an assessment survey to evaluate the school health environment for wellness policy development was the least often completed task. Lastly, several factors were analyzed to determine their impact on federal wellness policy compliance scores and ALSDE mandate compliance scores. There were no significant differences in federal wellness policy or ALSDE mandate compliance scores based on system type, enrollment, percentage of students eligible for free and reduced-price meals, use of an environmental assessment survey, and use of wellness committee and a registered dietitian/nutrition degree holder during policy development. AL school systems did well creating school wellness policies with appropriate content. This does not, however, guarantee good quality or effective policies. School systems have not done as well implementing ALSDE mandates, demonstrating a delay between school health policy creation and implementation. Future research is needed regarding progress school systems make in implementation of school health mandates, and on the factors influencing that progress.

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CHAPTER I

INTRODUCTION

Obesity is a worldwide problem; however, the United States leads the world in prevalence and severity of the disease. In 2005-2006, 34.4% of Americans were obese and 15.5% of children were overweight (CDC 2007a, Ogden and others 2008). Rates of childhood obesity in Alabama (AL) are similar to national estimates (CDC 2006, CDC 2008a). The cause of childhood obesity is multifactoral; possibilities include genes and the environment that are ultimately associated with increased energy consumption and inadequate energy expenditure (Anderson and Butcher 2006). Consequences of childhood obesity can affect many physiological systems, and may also have a negative effect on children's psychology (Daniels 2006, Dietz 1998).

There is widespread recognition of childhood obesity as a serious problem and support for multiple interventions and preventative strategies. Many recent interventions have been targeted at the environmental causes of childhood obesity (Boon and Clydesdale 2005). Because schools have the unique ability to influence the health education, nutrition, and physical activity environments in which students spend the majority of their days during the school year, school health policies have been spotlighted in the obesity intervention process (Story and others 2006). The Child Nutrition and WIC Reauthorization Act of 2004 required all school systems participating in United States Department of Agriculture meals program to create a wellness policy by the beginning of the 2006-2007 school year (USDA 2008a). The

Federal Government issued guidelines for development of these policies. Following this release, the Alabama State Department of Education (ALSDE) issued specific food and nutrition mandates (ALSDE 2005a).

Wellness policies are important steps forward in the fight against childhood obesity; however, policies are not formally evaluated outside of the school system and no process is in place to evaluate implementation of all school systems' compliance with ALSDE mandates. Evaluation of wellness policies and mandate implementation is crucial to define the most effective courses of action and to determine proper resource allocation. The purposes of this study were to evaluate AL school system wellness policies, to determine compliance of AL school systems in ALSDE food and nutrition mandate implementation, and to determine factors that significantly impact policy compliance and mandate implementation.

CHAPTER II

LITERATURE REVIEW

The literature review addresses the definition, prevalence, potential causes, and consequences of childhood obesity. Current treatment and intervention strategies are presented, highlighting the ability of primary and secondary schools to influence the childhood obesity epidemic. Information regarding success of previous school-based health interventions, as well as current evaluations of United States (US) school health environments following the federally mandated development of school wellness policies is also presented.

Definition of Childhood Obesity

According to the US Centers for Disease Control and Prevention (CDC), overweight and obesity are ranges of weight above what is considered healthy for a particular height and correlated with increased health risks (CDC 2007b). Calculated in kg/m^2, body mass index (BMI) evaluates weight in relation to height, and is currently an internationally accepted index of adiposity classification in adults; cutoff points of 25 and 30 are used to define overweight and obesity, respectively (CDC 2007b, Dietz and Bellizzi 1999).

The use of BMI to identify obese children has been criticized because maturation and growth patterns affect body composition; therefore, BMI varies considerably by age and gender (Dalton and Watts 2002, Dietz and Bellizzi 1999). Because of varying growth rates and ranges of height and weight considered normal, using a specific cutoff may identify a

disproportionate number of tall, apparently overweight children, while short, overweight children are not detected (Dalton and Watts 2002). Despite limitations, BMI offers a reasonable measure of fatness in children and adolescents; BMI is the best choice among available measures that can be easily assessed at low cost and has a strong association with body fat and health risks. In addition, measurements of height and weight used to calculate BMI usually have high reliability (Dietz and Bellizzi 1999, Wang 2004).

Because BMI varies considerably by age and gender, age- and sex-specific cutoff points are used (Dalton and Watts 2002, Wang and Wang 2002). The US has used 85th and 95th age- and sex-specific BMI percentiles, above which previously defined overweight and obesity, respectively (Dalton and Watts 2002). The earlier US BMI cutoffs developed by the National Center for Health Statistics in the 1970s were revised in 2000 by the CDC for ethnic diversity. BMI at 85th-95th percentile defines “at risk for overweight”, while BMI greater than the 95th percentile is defined as “overweight”. The term "obese" is used in academic and medical research communities but is not currently used to label the individual child (CDC 2007b, Dalton and Watts 2002).

Prevalence of Childhood Obesity

BMI cutoff points around the world vary between the 85th and 97th percentile (Guillaume 1999). Small differences in BMI cutoffs could result in large differences in estimates of the prevalence of childhood obesity. Because countries employ different cutoffs, methods, and reference populations, international comparisons and an international definition of childhood obesity have been hampered. However, Wang and coworkers (Wang and others 2002) reported the prevalence of overweight slightly

increased in China, tripled in Brazil, nearly doubled in the US, and decreased in Russia, following economic hardship, in years examined. This study suggested increases in childhood obesity are not limited to high-income countries. However, the highest annual increase of overweight was in the US (0.57%).

The increase in US childhood obesity began in the 1980s and has nearly tripled since (Anderson and Butcher 2006). According to the National Health and Nutrition Survey (NHANES) 2003-2004, there was a significant increase in the prevalence of childhood overweight from 1999-2004; prevalence of overweight female youth increased from 13.8% to 16.0% and prevalence overweight male youth increased from 14.0% to 18.2% (CDC 2007c, Ogden and others 2006). Ogden and colleagues (Ogden and others 2006) documented differences among racial groups using NHANES 2003-2004 data: Mexican American male youth were significantly more likely to be overweight than were White males, and Mexican-American and Black female youth were more likely to be overweight than were White female youth.

The 2005-2006 NHANES data suggests no significant change in the prevalence of childhood obesity in the US since 2003-2004; 17.1% of children were at or above the 95th percentile of BMI charts in 2003-2004, compared to 15.5% in 2005-2006 (Ogden and others 2008). Upon combining NHANES datasets, Ogden and colleagues (2008) found no statistically significant trends in high BMI from 1999-2006.

The US Southeast has experienced the largest increase in obesity prevalence. According to the 2007 Behavioral Risk Factor Surveillance Survey, Alabama (AL) was the fifth "fattest" state in the nation, with 66.6% of adults being either overweight or

obese; the 2007 national average was 62.9% (CDC 2006). The 2003 Youth Risk Behavior Survey reported 14.5% of AL high school students were at risk for overweight, while 13.5% were overweight (CDC 2008a). By 2005 those figures had increased to 17.8% and 14.8%, respectively.

The Georgia Childhood Overweight Prevalence Survey reported prevalence of overweight and risk for overweight plus overweight in Georgia 4th, 8th, and 11th grade students to be 20.2% and 36.2%, respectively (Lewis and others 2006). These figures are higher than national estimates for the state. Extent of overweight, the degree to which children exceeded the threshold for overweight, was over two times higher than national estimates. Results also produced differences in the prevalence of obesity in ethnic groups, suggesting that national data could be under-representative of the childhood obesity epidemic, especially in the Southeast.

Causes of Childhood Obesity

Obesity is a multifactoral disease. In a comprehensive review of potential causes, Anderson and Butcher (2006) state changes in genetics and in the environment play a role in the childhood obesity epidemic. Obesity can be a secondary disease resulting from a primary disease such as Prader-Willi syndrome (Anderson and Butcher 2006). However, these endogenous factors are responsible for less than 5% of obesity. Although 25-40% of BMI can be inherited, the genetic pool has not changed fast enough to completely explain recent increases in childhood obesity.

More likely explaining the obesity epidemic are changes in the environment (Anderson and Butcher 2006). Multiple environmental factors promote behavior changes that

increase energy intake and limit energy expenditure. It has been said "…it is hard to envision an environment more effective than ours [in the USA] for producing…obesity" (Battle and Brownwell 2001). Put simply, obesity is caused by an imbalance between energy intake and energy output. It has been suggested that fast foods, sweetened beverages, low nutritive snacks are a few factors responsible for increased energy intake (Anderson and Butcher 2006). Increased consumption of food away from home, larger portion sizes, and price changes are other factors theorized to contribute to the rise in childhood obesity.

Outlets for energy expenditure include the basal metabolic rate (BMR), diet-induced thermogenesis, and physical activity (Anderson and others 2001). It appears obese children do not have a below average BMR, so lack of physical activity is likely the primary energy expenditure problem. It may be explained due to trends such as urban sprawl that limit physical activity, and the increased popularity of sedentary activities such as television viewing, and computer and video game use (Anderson and Butcher 2006). Also, the number of children with both parents in the work force has increased, resulting in increased consumption of food away from home and decreased physical activity opportunities for the family.

Other environmental factors include changes at school (Anderson and Butcher 2006). An emphasis on academics at school has eliminated some physical education and recess time, and budget pressures have led to contracts with major soft drink companies in attempts to increase funds. Vending machines, school stores, and à la carte products compete with the national school meal programs and increase the presence of low nutritive foods and beverages in the schools.

Consequences of Childhood Obesity

Diseases once defined by adulthood are now affecting today's youth. Daniels (2006) and Dietz (1998) reviewed the consequences of childhood obesity and reported that obesity impacts many physiological systems: cardiovascular, metabolic, pulmonary, gastrointestinal, and skeletal. Obesity can also impact psychosocial development and the economy.

Cardiovascular Consequences

Obese children are about nine times more likely to have elevated blood pressure, or hypertension (HTN) than their non-obese peers (Daniels 2006, Dietz 1998). Hypertensive youth are also at risk for left ventricular hypertrophy (LVH), a thickening of the left ventricle that may result in arrhythmia, congestive heart failure, ischemic heart disease, and sudden death. Increased weight and BMI are associated with an increased risk of coronary artery calcium deposits and cholesterol abnormalities that accelerate atherosclerosis in children and adolescents (Daniels 2006, Dietz 1998). It is not uncommon for obese youth to experience a pattern of blood lipid changes: decreased high density lipoprotein cholesterol (HDL), and increased low density lipoprotein cholesterol (LDL) and triglycerides (TG) (Dietz 1998).

Metabolic Consequences

Type 2 diabetes mellitus (DM-2), a disease once commonly diagnosed in adults over 40 years old, is now diagnosed in children as young as eight years (CDC 2008b, Daniels 2006,). DM-2 in youth has increased dramatically, paralleling the increase of incidence and severity of obesity, and is predominant in Black and Hispanic youth (AOA 2005, Dietz 1998,). DM-2 accounted for only 2-4% of all childhood diabetes before 1992, but

increased to 16% by 1994 (AOA 2005). Obese youth are 12.6 times more likely than non-obese youth to have high fasting blood insulin levels, a risk factor for DM-2.

Metabolic syndrome (MetS), also called Syndrome X, is a group of factors including increased waist circumference, HTN, increased TG, decreased HDL cholesterol, and elevated blood sugar (Daniels 2006). In one study using a definition of pediatric MetS comparable to the Third Report of the Adult Treatment Panel (ATP III) definition and data from the Third National Health and Nutrition Survey (NHANES III), 63.4% of children age 12 years or older had at least one metabolic abnormality, while 9.2% had MetS (de Ferranti and others 2004). About one-third of overweight or obese adolescents had MetS. Similar to adults, the greatest prevalence of MetS was seen in Mexican-American, followed by White, children. Weis and colleagues (2004) report a high prevalence of MetS in obese youth (up to 50%) that increased with increased obesity.

Other Physical Consequences

Pulmonary complications of obesity include asthma and sleep apnea (Daniels 2006, Dietz 1998). Prevalence and severity of asthma have paralleled the increase in childhood obesity. Obstructive sleep apnea, the periodic absence of breathing during sleep due to airway collapse, occurs in about 7% of obese children (Dietz 1998). Sleep apnea has been reported to decrease childhood mental function.

Obesity can have gastrointestinal complications such as non-alcoholic fatty liver disease and non-alcoholic steatohepatitis (Daniels 2006, Dietz 1998). It has been estimated that 50% of obese children have fat deposition in the liver, while 3% have more advanced steatohepatitis (Daniels 2006).

Developing bone and cartilage may not be strong enough to carry excess weight. As a result, a variety of orthopedic complications present in obese children (Daniels 2006, Dietz 1998). These problems include Blount disease, a bowing of the tibia causing abnormal mobility; and slipped capital femoral epiphysis, a rotation of the femur out from under the growth plate, resulting in pain and immobility (Daniels 2007).

Other adverse health affects related to obesity include polycystic ovary syndrome and pseudotumor cerebri, increased intracranial pressure resulting in headache and vision problems (AOA 2005, Daniels 2006, Dietz 1998). Finally, childhood obesity typically leads to adult obesity, and adult obesity has been associated with increased illness and death; the annual obesity-related death rate has been estimated from 112,000-400,000 (Daniels 2006).

Psychosocial Consequences

Dietz (1998) claimed the most widespread consequences of childhood obesity are psychosocial. Overweight children have more peripheral and isolated relationships than do normal weight children. Children aged 10-11 years were more likely to choose friends with a variety of handicaps over obese children. Average weight children associated obesity with laziness, sloppiness, stupidity, ugliness, dirtiness, lying, and cheating (Dietz 1998, Must and Strauss 1999).

Altered self-image and depression have been concerns in overweight children. Although some obese youth have reported low self-esteem, actual prevalence of low self-esteem in this group does not appear high (Must and Strauss 1999). Dietz (1998) reports obese children do not usually have low self-esteem, although obese adolescents may

develop a negative self-image that may persist into adulthood. Also, children and adolescents with depression are more likely to develop abnormal eating patterns, participate in less physical activity, and experience increased BMI; yet increased BMI was associated with increased symptoms of depression (Daniels 2006).

Economical Consequences

National spending for overweight and obesity accounted for 9.1% of annual medical spending, a figure rivaling that of smoking (CDC 2007d). In 1998, overweight- and obesity-related expenses may have reached $78.5 billion; that number was estimated at $92.6 billion in 2002. Estimated obesity-attributable spending in AL from 1998-2002 was $1.3 billion. Increased costs for obesity and obesity-related disease are often covered by Medicare or Medicaid, meaning that increases in obesity will place further demands on public health care dollars. Indirect economic costs of adult obesity, such as reduced economic opportunity or reduced productivity, are estimated at $23 billion a year (Daniels 2006). Indirect costs of childhood obesity are unknown, but costs may arise in the form of missed school for children and missed work days (Daniels 2006).

Treatment and Intervention

Treatment and prevention of childhood obesity are the best ways to combat the obesity epidemic. In a review of childhood and adolescent obesity interventions, Boon and Clydesdale (2005) suggest that, given the young age at which food preferences and lifestyle behaviors are developed, interventions may be more cost-effective if targeted at youth. The two most common intervention strategies can be classified as medical and environmental, as discussed hereafter.

Medical

Interventions are typically conducted on an outpatient basis from a primary care setting, or in intensive treatment programs (Boon and Clydesdale 2005). Outpatient approaches involve surgical and pharmacological therapies and/or lifestyle-based interventions which include diet, physical activity, and behavior alterations (Barlow and others 2002, Boon and Clydesdale 2005). A survey of pediatric healthcare providers identified changes in eating patterns and increased physical activity as the most common treatment interventions for overweight youth (Barlow and others 2002). Practitioners rarely advocated very restrictive diets, prescription medication, or herbal remedies, and mostly commonly recommended these methods for adolescents as opposed to younger children. Gastric surgeries are not typically recommended, but are performed in some centers.

Environmental

Because of the psychological immaturity of children, and impressionability to peer and parental pressures, treatment of childhood obesity is difficult (Barlow and others 2002, Boon and Clydesdale 2005, Golan and others 1998). Therefore, most environmental interventions have been family- and school-based.

Family-based Interventions

The home environment influences children's consumption in many ways (Golan and Crow 2004, Golan and others 1998). Parents and caregivers provide food, and provide the environment in which eating and physical activity behaviors are developed. Parents also serve as eating and activity behavior role models. In the treatment of childhood obesity, parental involvement has been beneficial. Weight loss interventions for children that involved

parents were more successful after one- (Golan and others 1998) and seven-year follow ups (Golan and Crow 2004) than were treatments that focused only on the child; the dropout rate for the parent-involved group was significantly lower, and the percent weight loss significantly higher, than in the child-only group.

School-Based Interventions

School-based interventions typically focus on improving the quality of school meals, increasing physical activity, and increasing nutrition education (Caballero and others 2003, Gortmaker and others 1999, Luekper and others 1996). Some well-known multi-component, school-based interventions include the Childhood and Adolescent Trial for Cardiovascular Health (CATCH) (Luekper and others 1996), Pathways (Caballero and others 2003), and Planet Health (Gortmaker and others 1999). Plant Health is regarded as one of the most successful interventions (Gortmaker and others 1999). The intensive two-year program was designed to reduce obesity in 6^{th} and 7^{th} grade students using behavior change lessons integrated into four subject curriculums and PE classes. Anthropometric data and student surveys were collected in the fall of 1995 (6^{th} and 7^{th} grade) and spring of 1997 (7^{th} and 8^{th} grade). Five control schools and five intervention schools in the Boston, MA area provided the 1295 student sample. Only girls in intervention schools showed a significant decrease in prevalence of and remission of obesity. Concerning secondary behavior change outcomes, self-reported television viewing was significantly decreased in boys and girls, and increased fruit and vegetable intake and decreased total energy intake was significant in girls.

The Pathways program was an intervention involving 1704 Native American Indian students in 41 schools across multiple US states (Caballero and others 2003). The three-year

program targeted classroom curriculum, food service, PE classes, and family involvement at home and in school events. Anthropometric and other data were gathered at the end of students' 2nd and 5th grade years. While significantly reducing fat content of school lunches and decreasing total calorie and dietary fat intake of students, percent body fat and BMI of the intervention group showed no significant improvements; percent body fat actually increased approximately 7% in both groups.

Finally, CATCH was a three-year intervention including 5106 ethnically diverse children from 56 intervention schools and 40 control schools across the US (Luepker and others 1996). Intervention schools received school food service modifications, PE interventions, and the CATCH curricula; half of the intervention schools received these components plus a family-based program, which made no statistical impact on primary outcomes. The two primary school-level objectives were reducing fat content of school lunches, and increasing the amount of time students spent doing moderate to vigorous physical activity in PE. Energy intake from total fat in school meals was significantly reduced in intervention schools, as well as energy intake from saturated fat and total energy intake. Sodium content of school lunches rose in both intervention and control schools. Though length of PE classes was not significantly different between intervention and control groups following CATCH, the intervention group received significantly more minutes of vigorous physical activity than did the control students. There were no significant differences in the primary student-level outcome of serum cholesterol levels. Also, differences in body measures such as BMI in control and intervention schools were insignificant at the three year follow-up.

These and other randomized, controlled school studies vary by type of intervention, length, sample age, grade, and ethnicity; drawing broad conclusions about effective methods is therefore limited (Budd and Volpe 2006). Though several of these well-designed interventions were unable to complete primary objectives, the school environment as a site for preventative and treatment intervention remains the focus of research and legislation; given the potential influence of the school environment, it is no surprise that the majority of all nutrition intervention programs between 1999-2004 occurred in schools (Hoelscher and others 2002).

The Role of Schools

The US Census Bureau estimated that 55.8 million children would be enrolled in school grades K-12 during the 2007-2008 school year (Census 2007). Children spend the majority of weekday waking hours at school, and consume approximately 19-50% of their daily calories there (USDA 2001). No other institution has that much contact with children (Story and others 2006). Modifiable aspects in treatment and prevention of childhood obesity include diet and physical activity; schools have an impact on both aspects. A healthy school environment offers students knowledge that supports development of healthful eating behaviors, and can offer the ability to improve or sustain nutritional health. Positive health messages can be endorsed in the school physical activity environment, the health curriculum, and the school food environment.

School Physical Activity Environment

Schools are able to modify the amount of physical activity students receive daily, and thus promote increased energy expenditure. Schools can promote physical activity

via physical education (PE) classes, recess, sports programs, clubs, etc. (Story and others 2006). However, PE requirements decline as students progress academically in grades each year. For example, the 2000 School Health Policies and Programs Study (SHPPS) (CDC 2007e) reported 8.0% of elementary schools, 6.4% of middle/junior high schools, and 5.8% of senior high schools provided daily physical education or its equivalent for the entire school year for students in all grades in the school. SHPPS 2006 (CDC 2008c) reported these changes: 3.8% of elementary schools, 7.9% of middle schools, and 2.1% of high schools provided daily physical education or its equivalent for the entire school year for students in all grades in the school in 2006. The percentage of states that required elementary schools to provide students with regularly scheduled recess increased from 4.1% to 11.8% and the percentage of districts with this requirement increased from 46.3% to 57.1% from 2000-2006.

In AL, every public and private school (excluding church schools) must offer PE in accordance with Alabama State Department of Education (ALSDE) program guidelines (ALSDE 2008a). Each student grades K-8 must have at least 30 minutes of PE daily, not to include lunch or recess. Other courses such as band may not be substituted for PE. In high school, students must receive one credit (one year or two semesters) of physical education in order fulfill graduation requirements. If the school system has certified PE teachers in grades K-8, it can request a waiver to substitute courses for the one credit of physical education for grades 9-12.

Schools must balance federal, state, and local priorities and resources for the activities included in the school day (Story and others 2006). Schools encounter demands for increased

academic achievement due to movements such as the No Child Left Behind Act of 2001, which defines achievement in academic terms alone. Despite data that suggests time spent in PE does not negatively impact academic performance, PE is not an area for which schools are pressured to produce results (Story and others 2006). Because PE has become a lesser priority, the quality of physical activity students receive during PE and recess may also be quite variable.

School Health Curriculum

Health education allows students to develop and demonstrate knowledge, attitudes, and skills needed to support good health (CDC 2007f). However, as with PE, the focus on achieving academic standards, and time and resource limitations, have made the health curriculum in many schools a lower priority (Story and others 2006). In AL, students in grades 8-12 must have only one-half credit in health to graduate (ALSDE 2008a).

School Food Environment

Efforts to provide quality physical and health education and nutritious school meals may be contradicted by school food environments that provide low nutritive foods, and opportunities to consume those foods (Briggs and others 2003, Story and others 2006). Policies regarding all foods and beverages available at school should reinforce positive health messages offered at school (Briggs and others 2003).

Food is available largely through the National School Lunch (NSLP) and School Breakfast Programs (SBP) administered by the United States Department of Agriculture (USDA). Eight-four percent of US public schools participate in the NSLP, while 63% of schools participate in the SBP (CDC 2008d). NSLP and SBP offerings must meet Dietary Guidelines for Americans standards to be eligible for reimbursement (USDA 2008b). Data supports

positive, and some negative, impacts of school meal programs on dietary intake (USDA 2001). School meal participants' caloric intake at lunch and for 24 hours was significantly higher than that of non-participants. Participants had significantly higher mean intakes of seven vitamins and minerals examined, and higher daily intakes of fiber and sodium than did non-participants. Participants' mean 24-hour total fat, saturated fat, and protein intake were generally higher, and their added sugar intake lower, than non-participants' intake.

Despite potential negative effects on the student diet, the school meals programs ensure availability of food to combat hunger experienced by many students, and minimal requirements of the meals provided help ensure nutritional adequacy, which may be linked to positive academic performance (Briggs and others 2003). However, participation in school meals programs decreases with age, and decreases as alternative, competitive foods become available (Story and others 2006, USDA 2001). Schools rely on federal reimbursement and food sale revenues to cover the cost of providing meals. To enhance revenue, schools may increase student meal participation, increase prices of meals, and increase the sale of foods sold outside USDA school meals. In many schools, food is also available through à la carte programs, school stores, vending machines, and fundraisers (French and others 2003, Kubik and others 2003).

Foods and beverages sold in competition with the USDA school meals program (competitive foods) are of two categories: foods of minimal nutritional value (FMNV) and all other foods offered for individual sale (USDA 2008b). Both categories are not required to meet nutritional standards required of USDA meals. FMNV are defined by the USDA as foods that provide less than 5% of the RDA for eight nutrients per serving or per 100 calories. (These nutrients are protein, vitamin A, vitamin C, niacin, riboflavin, thiamin, calcium, and iron.) The

four primary FMNV categories include: carbonated beverages, water ices, chewing gum, and certain candies. The USDA regulates sale of these foods; school food authorities must prohibit sale of FMNV in food service areas during meal times. Sale of FMNV is not restricted outside the food service area at any time during the school day. Sale of all other individual competitive foods is not prohibited at any time, or in any place on the school campus. These foods include products that may be purchased in addition to, or in place of reimbursable school meals. These foods do not include FMNV, but do include all food available in the food service line, cafeteria vending machines, school stores or snack bars, and à la carte. Snack products like chips and desserts like ice cream are of this category. These items, though not generally considered healthy foods, are not considered FMNV because they contain more than 5% of one of the eight nutrients listed above. The sale of competitive foods is allowed only if all income from the sale of these foods accrues to the benefit of the nonprofit school food service or school or student organizations approved by the school (USDA 2008b).

SHPPS 2006 reported 32.7% of US elementary schools, 71.3% of middle schools, and 89.4% of high school schools have vending machines, school stores, and other programs that offer foods to compete with USDA school meals; these numbers were lower than reported in SHPPS 2000 (CDC 2008d, CDC 2008e). French and colleagues (2003) reported an average of 12 food and beverage vending machines per school in a 20 school Minnesota study in 2003. Eighty percent of the snack vending machines and 37% of beverage vending machines were turned on at all times, and only 35% of foods in the à la carte program and 36% of vending machine products met low-fat criteria.

A few studies have determined that the school food environment significantly influences the dietary habits of adolescents. For example, when competitive foods became available to students transitioning into middle school, fruit, vegetable, and milk intake decreased while fat and sugar intake increased (Cullen and Zakeri 2004). Kubik and coworkers (2003) reported the presence of each snack vending machine decreased mean fruit intake by 11%. Researchers also reported à la carte programs were associated with increased consumption of energy and saturated fat, and inversely associated with fruit and vegetable intake. Students from schools without à la carte programs consumed one serving more of fruits and vegetables daily, met USDA recommendations regarding percent of energy from total fat, and exceeded saturated fat recommendations significantly less than students from schools with à la carte programs (Kubik and others 2003).

School Health Policies

Comprehensive policies provide guidelines for the development and maintenance of broad school health programs, and are a cost-effective method of promoting environmental changes, which may help effect individual changes (Briggs and others 2003, Vecchiarelli and others 2006). Comprehensive school health policies promote healthy behaviors, thereby reinforcing health messages students receive in the classroom (Briggs and others 2003). This approach not only changes the school environment, but can also impact student knowledge, attitudes, and skills that are needed to support healthy behaviors (Vecchiarelli and others 2006). For example, research suggests students report lower smoking rates when schools have comprehensive smoking policies that restrict or ban smoking and promote smoking prevention education (Brannon and others 1989).

Neumark-Stzainer and colleagues (2005) reported that school food policy, not just the school food environment, is associated with high school students' intake. Students attending schools with open-campus lunchtimes consumed more food from fast food restaurants and convenient stores at lunch than did students unable to leave campus for lunch. Students attending schools with policies regarding the types of food allowed for sale in snack vending machines made significantly fewer snack food purchases per week than did students in schools with no vending policies. Also, the number of soft drinks sold in schools that turned off beverage vending machines during lunchtime was significantly lower than in schools that did not restrict hours of operation for beverage vending machines.

Veugelers and Fitzgerald (2005) examined the effectiveness of school health programs in Novia Scotia and found that 5th grade children from schools operating programs consistent with CDC guidelines for healthy schools (programs that impact multiple school operations such as policy, curriculum, food services, etc.) exhibited significantly lower rates of overweight and obesity than did students from schools with no nutrition programs. Students from schools with programs that only affected cafeteria menus did not have significantly lower rates of overweight and obesity as compared to schools with no nutrition programs. Veugelers and Fitzgerald (2005) note the difference between schools with comprehensive programs and schools with healthy menu alternatives alone suggests that students may not always choose healthy foods when offered, further demonstrating the need for comprehensive health policies beyond lunchroom changes.

Support for School Health Policies

A comprehensive health policy requires support from administrators, but will be unsuccessful if those involved in day-to-day school activities (parents, students, teachers, etc.) do not support the policy. Vecchiarelli and coworkers (2006) investigated the impact of nutrition policies on student dietary habits by surveying high school students regarding portions of school policies related to soda and junk food bans. Over half of the students surveyed (55.5% beverage, 52.6% snack) believed school food policies impacted their beverage and snack intake at school. Only 16.2% and 20.2% of all students reported the policies impacted beverage and snack intake, respectively, away from school. However, students that believed policies impacted intake at school also reported they ate and drank significantly fewer banned items at school and at home.

Kubik and colleagues (2005) reported that the majority of parents and teachers surveyed supported healthy school environments. Most parents and teachers believed the school environment influenced students' food choices. In fact, 80% of parents and 88% of teachers felt students should not be able to purchase soft drinks and candy at school. Also, most parents and teachers thought schools should be free of commercial food and beverage advertisement. Only 18% of parents and 31% of teachers thought schools gave enough attention to student nutrition. While most parents and teachers thought it was important for schools to have written nutrition policies, only a third of teachers felt they could influence the policies (Kubik and others 2005). Finally, a national poll by the Robert Wood Johnson Foundation (2008) reported teachers and parents believe physical activity improves learning; 81% of teachers and 88% of parents support PE requirements for all grade levels.

Schools have the ability to influence student health behaviors. Perhaps more importantly, students, parents, and teachers believe the school food and nutrition environment impacts student choices, and parents and teachers generally support healthy school environment changes, further demonstrating the opportunity to make effective changes to the school health environment (Kubik and others 2005, Vecchiarelli and others 2006).

Federal and State Acts Affecting School Nutrition and Health Programs in Alabama

The Federal Government recognized the role of schools in obesity prevention in 2004 with the Child Nutrition and WIC Reauthorization Act (USDA 2008a). This act required all schools participating in USDA meal programs to develop written school wellness policies before the start of the 2005-2006 school year. The Act included five broad guidelines, mandating each policy include: goals for nutrition education and physical activity, nutrition guidelines for foods provided at school, assurance that requirements for school meals meet USDA guidelines, an evaluation plan, and involvement of parents, students, and representatives of the school lunch room or Child Nutrition Program, the school board, school administrators, and the public in policy development (USDA 2008a). While the law requires wellness policies to set nutrition standards for all foods available on campus, many states have required standards that extend beyond USDA's policies (SNA 2006a).

The Alabama State Department of Education (ALSDE) issued more specific school health guidelines for AL school systems (ALSDE 2005a). In July 2004, the ALSDE appointed a committee to review the state of health of Alabama's youth

(ALSDE 2004). Exercise and nutrition subcommittees were created, and their recommendations for AL schools were presented to the State Superintendent and State Board of Education in February 2005. The Superintendent revised the committee's recommendations, and the Board adopted the revised guidelines (ALSDE 2005b).

Evaluating School Nutrition and Health Policies

In May 2006, the Center for Science in the Public Interest (CSPI) (2006) evaluated competitive food and beverage policies in all 50 states and the District of Columbia. The National Alliance for Nutrition and Activity (NANA) model nutrition standards were used as the basis of the grading scheme. State policies were issued a grade based on five components: food and beverage nutrition standards, grade levels to which policies apply, and location and time to which the policies apply. Grades were issued based on policy content alone; states with high grades had strong nutrition standards for foods and beverages throughout the school campus, school day, and throughout all grade levels. With an A-, Kentucky was the only state to receive an A. AL, along with four other states, received a B+. Twenty-three states received an F due to absence of policies for regulation of competitive foods beyond the USDA policy.

CSPI (2006) concluded that although positive changes are occurring at the state level, nation-wide there is only a patchwork of strong state policies. However, many states have improved nutrition standards over the past several years, and many policies are in the process of being implemented. It is important for state policy to guide school action, as existence of state and district tobacco policies have been linked positively to school-level practices (Boerm and others 2007).

However, implementation and evaluation of wellness policies are the responsibility of the individual school systems (USDA 2008a). Also, policy development is federal law, but the AL guidelines are ALSDE mandates for school action, and are not state law. While schools abide by these regulations, there is no known repercussion for failure to create a wellness policy and no system in place to monitor all AL school systems' adherence to ALSDE mandates (ALSDE 2005a). Although USDA Child Nutrition Program (CNP) personnel in each school system are responsible for USDA school meals programs, and are in a position to monitor food policies, there is no single way to monitor each school system for implementation of all ALSDE mandates and development of individual wellness policies. To gain insight, evaluations of US school health policies have occurred.

Prior to and following the Child Nutrition and WIC Reauthorization Act of 2004, multiple agencies such as the CDC, NANA, American Academy of Pediatrics, and the Institute of Medicine (IOM), issued recommendations for the school environment (Greves and Rivara 2006). Research teams and national agencies, including Action for Healthy Kids (AFHK) and the School Nutrition Association (SNA), have used such recommendations to evaluate wellness policies of US school systems (AFHK 2006, SNA 2006a, SNA 2006b).

Studies Evaluating Compliance with All Policies

Metos and Nanney (2007) evaluated the content and quality of wellness policies from 30 of 40 (75%) Utah public school districts against the federal guidelines and recommendations made by Utah AFHK. Policies were compared to each section of the federal guidelines: nutrition and physical activity goals, guidelines for foods provided at school, monitoring, and parent/community participation. Policies were considered in

compliance with the guidelines if one written statement that addressed each guideline was present. Seventy-eight percent of district policies were in compliance with all five federal guidelines. The most frequently excluded component was guidelines for competitive foods.

Metos and Nanney (2007) also compared policies to Utah AFHK recommendations, and assessed policy quality by examining whether policies recommended or mandated included components. AFHK recommendations most likely to be included in district policies were vending restrictions for elementary schools, wellness programs for parents, and increasing physical activity in secondary schools. Least likely to be addressed were recommendations such as competitive pricing for healthy foods, making recess a priority in elementary schools, and having fruits and vegetables available where all foods are sold. Districts, on average, mandated only seven of the potential 32 state recommendations; mandates frequently addressed curriculum required by the State Board of Education and preexisting vending policies.

AFHK is a non-profit, public-private partnership of over 50 organizations and government agencies created to address youth health by focusing on school level changes (AFHK 2006). AFHK collected 112 local wellness policies from school districts of 42 states; the sample included schools of varying enrollment and location. Policies were assessed for each area required by the Child Nutrition and WIC Reauthorization Act, and were then evaluated using "Wellness Policy Fundamentals", a wellness policy tool developed by AFHK, CDC, USDA, and other partners. "Wellness Policy Fundamentals" expands on each recommended policy area by listing specific outlets to be addressed. (For example, under nutrition education goals, classroom teaching, education/marketing outside class, and teacher training are listed.)

This guide was used as a benchmark for quality of local wellness policies evaluated in the study. Results indicated 54% of school districts complied with all federal policy guidelines, and that compliance varied dramatically among districts.

In addition to determining percentage of policies in total compliance with federal guidelines, AFHK (2006) and the SNA (SNA 2006a) used policy samples from across the nation to determine compliance with individual components of the federal policy guidelines: nutrition education and physical activity goals, competitive foods, USDA school meals, and evaluation with designation of responsible parties.

Studies Examining Compliance with Nutrition Education and Physical Activity Goals

The SNA developed a wellness policy analysis tool based on the federal law and SNA objectives. Similar to AFHK (2006), the SNA (2006a) outlined specific components expected for each section of the federal wellness policy guidelines. SNA analyzed 94 of the largest 100 school districts' wellness policies; the top 100 were chosen because of the large proportion of children reached in these districts (SNA 2006a). SNA repeated this method using 140 wellness policies from 49 states with similar findings (SNA 2006b). The majority of districts established nutrition education goals (97%) and physical education goals (96%) (SNA 2006a). Also, half of the policies included recess requirements for elementary schools. AFHK (2006) also found high compliance with nutrition education and physical activity goals when reviewing 112 polices from 42 states. AFHK (2006) reported 86% of policies reviewed identified goals for nutrition education, while 82% included goals for physical education and activity.

Greves and Rivara (2006) evaluated nutrition policies for competitive foods in the largest district from each state during the 2004-2005 school year, prior to the mandatory requirement of local wellness policies. The authors reported most districts surveyed had competitive food nutrition policies; however, very few districts had extended the policy to address other aspects of total school wellness, such as nutrition education (32%) and PE (11%). When comparing these relatively low percentages of districts with nutrition education and PE policies to the relatively high frequencies of systems with these policies documented by AFHK (2006) and the SNA (2007a), it seems substantial progress has been made nationwide in development of policies addressing nutrition education and physical activity since the Child Nutrition and WIC Reauthorization Act of 2004.

Studies Examining Compliance with Competitive Food Policies

The federal requirement to include nutrition guidelines for all foods available throughout the school day has been interpreted to represent guidelines for all foods and beverages available outside school meals. The percentage of policies addressing nutrition standards for competitive foods, and the language used to do so, were variable in policy evaluations. AFHK (2006) reported 42% of policies addressed standards using a general statement about competitive foods available, while others addressed specific outlets for competitive foods. Both AFHK (2006) and the SNA (2006a) evaluated compliance with the requirement for competitive food guidelines by reporting frequency of wellness policies that addressed foods available through several common outlets: à la carte, vending machines, fundraisers, classroom celebrations, and food-based reward systems.

The chart below summarizes the percentage of policies from both AFHK and SNA publications that addressed various competitive food components. By calculation, an average of 54% of AFHK district policies and 61% of all SNA district policies addressed each competitive food category. Vending regulations were the most commonly addressed component in both publications, and policies regarding classroom celebrations were the least addressed component (AFHK 2006, SNA 2006a).

Competitive Food Outlet	AFHK: Addressed (%)	SNA: Addressed (%)
À la carte	45	65
Vending	66	65
Fundraising	59	62
Classroom Celebrations	40	53
Food as Reward	60	58
Average	54	61

While these releases document that over half of policies reviewed address competitive foods, less than half of respondents indicated existence of nutritional guidelines for competitive foods in a 2006 Pennsylvania survey of high school principals and food service directors (FSDs) (McDonnell and others 2006). The survey offered two choices regarding policy existence: policy exists and is enforced, and policy exists but is not always enforced. To document total policy existence, the categories are combined here. For each competitive food outlet, results are reported as percent of FSDs/percent of principals reporting policy existence: à la carte (17.8/44.8), vending machines (11.9/20.3), school stores (4.7/8.8), classroom celebrations (3.3/2.5), and food rewards (9.7/10.1). Classroom celebrations were again the least addressed competitive food outlet. A higher percentage of

respondents indicated recommendations, but not policies, existed for these categories. The study also showed significant differences in responses of the two groups surveyed.

This study shows a disappointing response to the Child Nutrition and WIC Reauthorization Act; however, results are representative of a sample of high schools in Pennsylvania (McDonnell and others 2006). More restrictive guidelines (i.e. more policies) often exist for lower grade levels and may be more common in other states (ALSDE 2005a). Therefore studies examining entire school systems from multiple states will likely report higher percentages of policy existence.

Greves and Rivara (2006) evaluated competitive food policies in the largest district for each state and DC during the 2004-2005 school year. Competitive food policies were defined as any policy beyond federal or state requirements that applied to foods and beverages outside the school meal program. Policies were compared to IOM recommendations for schools; policies were assessed based on restrictions on content and portion size, venues allowed, time of day to which the policy applies, differences in policy by school level, and other areas such as nutrition education or food marketing recommended by IOM. Nineteen of 51 (39%) of school systems had competitive food policies. Of those 19 policies, most addressed vending machine products (95%), à la carte offerings (79%), and products in school stores (79%); however, only 47% addressed food available via fundraisers. While changes in competitive food policy were taking place at the district level prior to the implementation of local wellness policies, no district met all of the IOM recommendations. These data demonstrate variability among which competitive food outlets are addressed, still seen today. It also suggests progress has been made in the number of

districts that have developed competitive food policies since 2004, as seen with nutrition education and physical activity policies mentioned above. However, Greves and Rivara (2006) required systems to have policies beyond federal and state requirements of the time. Other studies mentioned follow the Child Nutrition and WIC Reauthorization Act of 2004 and assess policy compliance with these guidelines; this may explain lower percentages reported by Greves and Rivara (2006) as compared to higher percentages reported by AFHK (2006) and the SNA (2006a).

Compliance with USDA meals

Federal guidelines require districts to provide assurance that school meal guidelines are not less restrictive than those set by the USDA (USDA 2008a). AFHK (2006) documented 75% of policies reviewed addressed goals for meeting USDA school meal standards, and the SNA (SNA 2006a) reported 97% of policies reviewed established nutrition guidelines for national school meal programs.

Compliance with Proposed Evaluation and Identification of Responsible Parties

The federal act identified the need for schools to continuously update and refine wellness policies (USDA 2008a). AFHK reported 81% of policies addressed implementation or evaluation, 60% of policies identified a responsible party for implementation, and 80% of policies indicated community and family involvement (AFHK 2006). (In addition, 61% indicated use of a school health council/wellness committee.)

Ninety-five percent of districts included in the SNA study had a plan for implementation and evaluation of wellness policies that identified individuals responsible (SNA 2006a). This is an improvement from the report from Greves and Rivara (2006) in

which only six of the 19 (32%) states with competitive food policies addressed monitoring and evaluation in 2004-2005.

In summary, results thus far are somewhat encouraging as most policies are meeting minimum requirements; total compliance rates range from 54% nationally (AFHK 2006) to 78% in Utah (Metos and Nanney 2007). Generally, over 50% of policies include each section of the federal law, with competitive food policies and wellness policy evaluation being the least addressed components (AFHK 2006, SNA 2006a). However, these numbers do not guarantee good quality policy nor do they guarantee implementation or evaluation to achieve premium effectiveness. It is the school systems' responsibility to implement and evaluate school health policies, and while effects of such policies will likely not immediately observable, analysis of policy implementation is warranted. Policies will be ineffective and worthwhile evaluation impossible if schools are not making progress toward achievement of policy goals.

Analyzing Implementation of Policies

To the author's knowledge, the only information released regarding evaluation of wellness policy implementation is survey data from the SNA. The SNA performed a one-year follow-up study by analyzing surveys from 976 school nutrition directors regarding implementation of local school wellness policies in 2007 (SNA 2007). The survey was conducted online using surveymonkey.com and contained questions in seven areas: demographics, nutrition standards, nutrition education, physical activity, other school-based activities, perception of wellness policy impact, and evaluation. With one month to complete the survey, the response rate was 28%. The sample included representatives from a variety of district locations, with a variety of enrollment sizes and school meal eligibilities.

A list of common nutrition education components was created for the survey (SNA 2007). Responses indicated that including nutrition education guidelines for all students in all grades was the most frequently addressed (93%) and most frequently implemented goal (54%). Integrating the school nutrition program into classroom nutrition education was addressed by 92% of the districts, and was 45% complete. One of the least addressed (87%) guidelines, and the least implemented (33% complete) guideline, was nutrition education for teachers and school nutrition professionals.

PE was recommended or required by 98% of districts, and 64% of districts reported this goal complete (SNA 2007). Requiring or recommending recess for certain grade levels was addressed by 94.2% of districts, while 65.8% reported complete implementation of recess guidelines.

For competitive foods, nearly half of the standards were general, while the other half included specific details (SNA 2007). The following chart summarizes the percentage of respondents that reported their wellness policy addressed various competitive food components, and includes the percentage of the respondents indicating their systems had implemented their policies. While an average of 89% of policies had policies regarding various outlets for competitive foods, less than half of policies had been completely implemented.

Competitive Food Outlet	Policy Addressed Outlet (%)	Implementation Complete (%)
À la carte	96	72
Vending	90	46
School Stores	82	38
Fundraising	87	29
Classroom parties	89	31
Food as reward	90	34
Average	89	42

Addressing USDA meals, 97% of policies included reimbursable meal standards (SNA 2007). Implementation of standards for reimbursable meals was 92% complete. Implementation of nutrition standards proved more difficult for foods sold outside the school meals program (SNA 2007), which is reflective of previously mentioned data regarding wellness policy compliance with federal guidelines. Foods available via the school meals program are under singular control of the USDA and participating food service programs. However, control of competitive foods is directed by the individual school or district, and can involve multiple parties. Coordination among these different groups may prove more difficult, thus implementation may be slower.

Only 42% of respondents reported their districts were evaluating implementation or impact of local wellness policies; however, 49% indicated they planned on evaluating their policies (SNA 2007).

An average of about 61% (29-92%) of school districts indicated complete implementation of Federal wellness policy requirements (SNA 2007). Implementation of these policies has often proved to be slow-moving.

Factors influencing policy compliance with federal guidelines and likelihood of policy implementation are largely unknown. In addition to research determining wellness policy compliance and implementation, some evidence of variation of health policies by school characteristics exists.

Factors Influencing Policy Development and Implementation

Four studies have examined the effects of school factors on policies. Metos and Nanney (2007) reported no significant differences in wellness policy compliance based on

district size, geographical location, and percent of students enrolled in free- or reduced-price meals.

Jones and others (2003) sought to determine whether prevalence of physical education, health services, mental health, and school environment policies varied by school level characteristics. SHPPS 2000 provided the dataset. Variables were combined into an index representing the number of policies, programs, and facilities in place at each school; each school could have a score of 0-18. Researches found elementary schools were the most likely, and high schools the least likely to restrict student access to competitive foods, and to prohibit soft drink advertising or avoid contracts with soft drink companies. The average index score was 11.0 for elementary schools, 10.4 for junior high schools, and 10.4 for senior high schools. No school had a score of 18, and less than 10% of schools had scores of 15 or more. Analyses also indicated public schools were more likely than private or Catholic schools, urban schools more likely than suburban and rural schools, and schools with larger enrollment more likely than smaller schools, to have higher index scores.

Brener and others (2003) authored an alternate article using SHPPS 2000 data and similar methodology as the Jones study (2003) to assess slightly different aspects of school health programs. School scores where calculated based on the presence of policies and programs for CDC-recommended components of a school health program. Public schools had higher scores for most school health program indices including health services, mental health and social services, and family and community involvement than did private and Catholic schools. The physical education score and food service scores were also higher in public schools. Urban schools had higher school policy and

environment scores compared to rural schools. The health education score was higher for suburban schools than urban schools. Larger schools had higher health education and school policy and environment scores than did smaller schools. Brener and coworkers (2003) found overall policy scores were higher in public schools, urban schools, and schools with larger enrollments. Private, Catholic, rural, and smaller schools did not have as many policies in place as their counterparts; however, no type of school was more likely than another to have all aspects of a comprehensive school health program in place. The authors suggested it is possible for any school to implement a quality school health program.

A school health council is a group of individuals from the school system and the community that provide input regarding school health policies. Brener and colleagues (2004) again used SHPPS 2000 data and reported school health councils were associated with existence of some important health policies (i.e. health and social services and faculty and staff health promotion), however a council did not guarantee existence of all crucial health policies. Schools with and without councils were equally likely to have health education, physical education, and food service policies. However, the federal government placed emphasis on the importance of this type of council (wellness committee) by requiring schools to form them during creation of wellness policies (USDA 2008a).

Though Brener (2003) and Jones (2003) suggest larger, urban, and public schools tended to have more policies in place before the federal act, it is unknown how such characteristics impact the presence of wellness policies as Metos and Nanney (2007) found no significant differences based on factors examined. Further evaluation of the impact of

such characteristics and other intuitively related characteristics such as school type (city or county), involvement of nutrition degree holders in policy development, and ALSDE mandated environmental assessments, is warranted.

Research and publications released from several organizations suggest many school systems have failed to create wellness policies that addressed all required federal guidelines. Methodological differences in areas such as interpretation of the federal law and grading schemes hamper extensive comparison; however, wellness policy evaluations available report variable levels of compliance. In addition, knowledge of the degree of policy implementation and factors influencing policy compliance and implementation is limited.

Justification

Given the alarming increase in the prevalence of childhood obesity in the nation and the Southeast, and the ability of schools to promote healthy lifestyles, school wellness policies are an important step forward in the treatment and prevention of childhood obesity. Evaluation of wellness policies and of state mandate implementation is a responsibility left to the school systems. No known repercussions exist for failure to create a wellness policy. Also, there is no formal system for evaluating all Alabama (AL) school systems' compliance with Alabama State Department of Education (ALSDE) food and nutrition mandates. Without such evaluation, it will be difficult to determine effective methods of change, and difficult to correlate positive school health changes with wellness policies. National and state evaluations thus far indicate under 80% of districts comply with all federal guidelines for wellness policies, and indicate variable adherence to individual components of the guidelines (AFHK 2006, Metos and Nanney 2007, SNA 2006a). Evaluation of wellness policies for an

entire state has only been conducted in Utah (Metos and Nanney 2007). There is currently no published research regarding wellness policies in AL, or in any other southeastern state. Determination of policy and procedure effectiveness will allow proper focus of school, community, and state resources, yet school systems cannot hope to positively impact student health if school policies are not meeting minimum federal guidelines and if districts are not enacting state mandates. The purposes of this study were to evaluate AL public school system wellness policies, to determine compliance of AL school systems in ALSDE mandate implementation, and to determine factors that significantly impact policy compliance and implementation.

Research Hypotheses

1. The percentage of Alabama (AL) school systems addressing all components of the Child Nutrition and WIC Reauthorization Act of 2004 will be less than 80%.

2. The percentage of AL school systems reporting implementation of Alabama State Department of Education (ALSDE) food and nutrition mandates applicable at the time of survey will be less than 80%.

3a. There will be a significant difference in federal wellness policy percent compliance between the school system types.

3b. There will be a significant difference in ALSDE food and nutrition mandate percent compliance between the school system types.

4a. There will be a significant difference in federal wellness policy percent compliance between the district enrollment groups.

4b. There will be a significant difference ALSDE food and nutrition mandate percent compliance between the district enrollment groups.

5a. There will be a significant difference in federal wellness policy percent compliance between the percentages of students eligible for free and reduced-price meals.

5b. There will be a significant difference in ALSDE food and nutrition mandate percent compliance between the percentages of students eligible for free and reduced-price meals.

6a. There will be a significant difference in federal wellness policy percent compliance between the districts that did and did not use an assessment survey to evaluate the school environment during wellness policy development.

6b. There will be a significant difference in ALSDE food and nutrition mandate percent compliance between the districts that did and did not use an assessment survey to evaluate the school environment during wellness policy development.

7a. There will be a significant difference in federal wellness policy percent compliance between the districts that did and did not form a group of individuals that met regularly to develop school wellness policies (a wellness committee).

7b. There will be a significant difference in ALSDE food and nutrition mandate percent compliance between the districts that did and did not form a group of individuals that met regularly to develop school wellness policies (a wellness committee).

8a. There will be a significant difference in federal wellness policy percent compliance between the systems that did and did not include registered dietitians or persons with nutrition degrees in wellness policy development.

8b. There will be a significant difference in ALSDE food and nutrition mandate percent compliance between systems that did and did not include registered dietitians or persons with nutrition degrees in wellness policy development.

CHAPTER III

EVALUTION OF ALABAMA PUBLIC SCHOOL WELLNESS POLICIES AND STATE SCHOOL MANDATE IMPLEMENTATION

ABSTRACT

Wellness policies from 91 of 131 (69%) Alabama (AL) public school systems were compared to federal guidelines required by the Child Nutrition and WIC Reauthorization Act of 2004. To assess the school food and nutrition environment, data were analyzed from 123 (94%) school system superintendent surveys regarding compliance with/implementation of school food and nutrition mandates issued by the Alabama State Department of Education (ALSDE) in 2005. School systems were evaluated (graded) based on the percentage of seven federal components addressed in the individual wellness policies. A second percentage grade was issued based on the percentage of ALSDE mandates completed. The majority of school systems (71%) were in full compliance with all federal wellness policy requirements. On average, school systems addressed 6.4 of the 7 components, for a mean percentage grade of 92%. Physical activity was the most frequently addressed component (99%), while evaluation of the wellness policy (80%) and identification of a party responsible for evaluation (79%) were the least addressed components. Mean implementation of ALSDE food and nutrition mandates was 79%. Only nine of 123 systems (7%) indicated completion of all

ALSDE mandates. Creation of a wellness policy and positive changes in cafeteria menus were the most commonly implemented mandates, and use of an assessment survey to evaluate the school health environment for wellness policy development was the least often completed task. Lastly, several factors were analyzed to determine their impact on federal wellness policy compliance scores and ALSDE mandate compliance scores. There were no significant differences in federal wellness policy or ALSDE mandate compliance scores based on system type, enrollment, percentage of students eligible for free and reduced-price meals, use of an environmental assessment survey, and use of wellness committee and a registered dietitian/nutrition degree holder during policy development. AL school systems did well creating school wellness policies with appropriate content. This does not, however, guarantee good quality or effective policies. School systems have not done as well implementing ALSDE mandates, demonstrating a delay between school health policy creation and implementation. Future research is needed regarding progress school systems make in implementation of school health mandates, and on the factors influencing that progress.

INTRODUCTION

Obesity is a worldwide problem; however, the United States leads the world in prevalence and severity of the disease. In 2005-2006, 34.4% of Americans were obese and 15.5% of children were overweight (CDC 2007a, Ogden and others 2008). Rates of childhood obesity in Alabama (AL) are similar to national estimates (CDC 2006, CDC 2008a). The cause of childhood obesity is multifactoral; possibilities include genes and the environment that are ultimately associated with increased energy consumption and

inadequate energy expenditure (Anderson and Butcher 2006). Consequences of childhood obesity can affect many physiological systems, and may also have a negative effect on children's psychology (Daniels 2006, Dietz 1998).

There is widespread recognition of childhood obesity as a serious problem and support for multiple interventions and preventative strategies. Many recent interventions have been targeted at the environmental causes of childhood obesity (Boon and Clydesdale 2005). Because schools have the unique ability to influence the health education, nutrition, and physical activity environments in which students spend the majority of their days during the school year, school health policies have been spotlighted in the obesity intervention process (Story and others 2006). The Child Nutrition and WIC Reauthorization Act of 2004 required all school systems participating in United States Department of Agriculture meals program to create a wellness policy by the beginning of the 2006-2007 school year (USDA 2008a). The Federal Government issued guidelines for development of these policies. Following this release, the Alabama State Department of Education (ALSDE) issued specific food and nutrition mandates (ALSDE 2005a).

Wellness policies are important steps forward in the fight against childhood obesity; however, policies are not formally evaluated outside of the school system and no process is in place to evaluate implementation of all school systems' compliance with ALSDE mandates. Evaluation of wellness policies and mandate implementation is crucial to define the most effective courses of action and to determine proper resource allocation. The purposes of this study were to evaluate AL school system wellness policies, to determine compliance of AL school systems in ALSDE food and nutrition mandate implementation, and to determine factors that significantly impact policy compliance and mandate implementation.

STUDY POPULATION AND METHODS

Study Population

Wellness policies and food and nutrition survey data were requested from 131 school systems in Alabama (AL). The 131 (67 county school districts and 64 city school districts) school systems (also called districts) in the AL public school system include 1538 schools (ALSDE 2007a). Total pre-kindergarten through 12th grade enrollment in AL's public school system was 742,789 in the 2007-2008 school year. City school systems serve children inside the city limits, and are funded with city taxes. County school systems exist for each county in the state and serve children that reside in the county, outside specific city limits. There may exist a county school system and a city school system within the same AL county. For example, Auburn and Opelika City schools are located in Lee County, but are separate from the Lee County school system. All public schools in the state are under the direct supervision of the Alabama State Department of Education (ALSDE).

School wellness policies in accordance with the Child Nutrition and WIC Reauthorization Act of 2004 were required from all public school systems in AL that participated in the United States Department of Agriculture (USDA) school meals program (USDA 2008a). Systems are also required to operate in accordance with ALSDE food and nutrition mandates adopted in 2005 (ALSDE 2005b).

Federal Wellness Policy Mandates

Approval and Collection Process

Each AL school system was required to submit a wellness policy to the Federal Programs section of ALSDE before the start of the 2006-2007 school year. The State School Nurse Consultant obtained ALSDE approval for this study from the AL State Superintendent, and provided copies of all school district wellness policies on file as of Summer 2006 for evaluation as part of this study. The State School Nurse Consultant, who directs Health Services for the Federal Programs Division of the ALSDE, was contacted after the study received support of the Alabama Department of Public Health Nutrition and Physical Activity Division. This division includes the Alabama Action for Health Kids director, as well as the co-chair of the Statewide Committee to Review the State of Health of America's Youth with Particular Emphasis on Alabama's Youth Report.

Guidelines for Evaluation

Federal wellness policy requirements were obtained from the USDA Food and Nutrition Service website (USDA 2008a). A policy content checklist was created from the federal guidelines. Components of the checklist included: nutrition education goals, physical activity goals, competitive food policies, assurance that school meals follow USDA

guidelines, a plan for measuring implementation (evaluation), a responsible party for evaluation, and use of a wellness committee in formation of the wellness policy. With at least one statement, policies must have addressed each component of the federal law to receive credit. General statements regarding competitive food policies were accepted. Though it did not impact the grading scheme, information was also recorded regarding policies that addressed the following outlets for competitive foods: à la carte, vending/school stores, fundraisers, food in the classroom (snacks, celebrations, special meals, instructional foods), and food-based reward systems. Information regarding use of a wellness committee was gathered from a survey, discussed in the section on the ALSDE food and nutrition mandates. Systems received credit if they responded positively to use of a wellness committee; information regarding members of the committee required by federal guidelines was also collected. Using the checklist, each system received a grade based on the percentage of the seven potential components addressed in the wellness policy. (In this text, the terms grades, scores, percent compliance are used interchangeably to refer to the percentage grade.)

ALSDE Food and Nutrition Mandates

Approval Process

Approval for the distribution and analysis of a 2007 survey to be sent to each AL school system superintendent was obtained from the AL State Superintendent of Education. ALSDE also facilitated the survey process by faxing a notice to all superintendents, alerting them to an upcoming email from the researcher. The 2007 survey provided information to evaluate the implementation of ALSDE food and nutrition mandates issued in 2005.

Survey Collection Procedures

One week after the fax was distributed by ALSDE, email messages were delivered to superintendents by the study investigator. Superintendent email addresses were available on the SDE website (ALSDE 2008b). Using the Survey Monkey electronic survey system, superintendents were emailed a link to the online survey in October, 2007. Survey Monkey was chosen for ease of distribution, data input and collection, and cost savings. Respondents had one month to complete the survey. Follow-up emails were distributed to non-responsive superintendents and their administrative assistants two and three weeks after the original email. Non-responsive districts were contacted via telephone during the fourth week, and survey availability was extended one week to further accommodate the systems.

Survey Content and Guidelines for Evaluation

A 2006 survey sent to all AL school systems addressing plans to improve the school health environment in AL schools provided the framework for the 2007 survey used in this research. Additional questions were included to address wellness policy development and to provide more information on ALSDE mandates. ALSDE food and nutrition mandates were obtained from the ALSDE website (ALSDE 2005a, ALSDE 2005c).

The 2007 survey included 45 multiple choice and short answer questions. Supplied answers for the multiple choice questions were designed to provide an idea of progress made in mandate implementation, regardless of whether the requirement should have been completely fulfilled or not. Answer choices indicated whether respondents had not begun to implement mandates, had made no progress, had made progress, or had completed each requirement. In the analysis, only questions regarding requirements that should have been

completed by the time of the survey were used. Each system was therefore graded on 19 possible points. Total points were converted into percentage grades for statistical analysis. Systems received credit if the survey response indicated the system had completed what was required of the mandate. Due to nonspecific language used in some mandates, exceptions were made for two questions when indication of any progress was accepted for credit. Also, because not all mandates are applicable in all school environments, and due to the difficulty ascertaining logic behind survey answers, questions were excluded from potential percentage grades when respondents indicated the question was not applicable (NA). Finally, because multiple schools comprise a system, a question was added to each section of the survey to assess what percentage of schools in the system the survey answers applied.

Statistical Analysis

Compliance with federal wellness policy requirements and implementation of ALSDE mandates were analyzed based on several factors, some of which have been shown to be influential in the literature. These factors included: system type (city or county), district enrollment ($\leq$4999 students and $\geq$5000 students), percentage of students eligible for free and reduced-price meals ($\leq$50% and >50%), use of a school environment assessment survey during policy development, and use of a wellness committee and a registered dietitian (RD) or professional with a nutrition degree during policy development. The 2007-2008 enrollment and free and reduced-price meal eligibility percentages for each system were obtained from the ALSDE website (ALSDE 2007b, ALSDE 2007c).

Survey responses and systems' federal and state percentage grades were compiled in Microsoft Excel, and then transferred to SPSS 16.0 for statistical analysis. Frequency

analyses were performed for each component of the federal policy grade, and for each survey question included in the state grade. Two sets of one-way analyses of variance (ANOVAs) were also performed, with a significance level of $p<0.05$. Federal policy grade was the first dependent variable, using the six factors mentioned above as independent variables. In the second set of tests, the ALSDE mandate implementation grade was the dependent variable, with the same six factors as independent variables.

RESULTS

Wellness Policy Compliance with Federal Guidelines

Wellness policies from 91 systems (45 city and 46 county) were included in the federal grade analysis. Of the 131 school systems, complete wellness policy information was unavailable for 35 systems, and five systems created policies for each school in the system. Despite these 40 exclusions, wellness policies analyzed represent 69% of AL public school systems.

Sixty-five of 91 school systems (71%) were in full compliance with all federal guidelines (Table 1). No system received a score of 0%, but the lowest score was 14% and was obtained by one system that only complied with the use of a wellness committee in policy development. Individual system percentage grades are presented in Appendix A. The average score was 6.4/7 components, or 92%. Reported by letter grade, there were 65 As, 9 Bs, 12 Cs, no Ds, and five Fs.

Nutrition education was addressed by 88 of the 91 systems (97%), and 90 systems (99%) addressed physical activity; these were the two most frequently addressed components of federal wellness policy requirements (Table 2). Competitive foods were also addressed by

88 systems (97%). Eight of the systems (9%) with general statements used the statement alone and did not address individual competitive food outlets. Table 3 provides a comparison of the percentage of competitive food outlets addressed in the present study, and in Action for Healthy Kids (AFHK) (2006) and SNA (2006a) reports. Regarding specific outlets, 70 systems in this study (77%) addressed fundraisers, 67 (74%) addressed vending machines/school stores, 50 (55%) addressed foods available à la carte, 48 (53%) addressed food in the classroom (parties, etc.), and 48 (53%) addressed using food as a reward. On average, the policies mentioned 3.1 of the five competitive food outlets. Only 22 of 91 systems (24%) addressed all five competitive food outlets.

Assurance that guidelines for school meals were no less restrictive than USDA guidelines was provided by 85 systems (93%). A statement regarding policy evaluation was provided by 73 systems (80%). However, only 72 systems (79%) designated responsibility of evaluation to a specific party. Evaluation and designation of responsible parties were the least addressed wellness policy components.

Finally, wellness committees were created by 87 systems (96%). Nearly half of the systems (43 systems or 47%) included all members as listed in the federal law. Representatives from the food service department (lunch room or Child Nutrition Program) were the most often included group with 86 systems (95%) reporting food service participation in wellness policy development. Parents were included in 80 systems' (88%) wellness committees, 65 (71%) included students, 65 (71%) included community members, and 60 (66%) included board members/administrators. The average number of federally required committee members included on each wellness committee

was four. Although not required by federal law, teachers were often found to serve as committee members with 82 systems (90%) including teachers in wellness committees. Also, with or without a wellness committee, about half of the systems (46 systems or 51%) indicated use of an RD/nutrition degree holder in the development of their wellness policy.

Evaluation of ALSDE Mandate Implementation

Response rate to the survey was 94% (123 of 131 systems). City and county school systems were equally represented as 62 city systems and 61 county systems responded. Superintendents completed 42% of the surveys, while CNP personnel were the second most common respondents at 31%.

Nine of 123 systems (7%) received a 100% grade. The lowest percentage grade was 16% received by one system, meaning only three of the 19 possible requirements had been fulfilled. Individual system percentage grades are presented in Appendix B. Mean percentage grade was 79%. Organized by letter grade, there were 33 As, 32 Bs, 24 Cs, 14 Ds, and 15Fs. Mean percentage grades categorized by the number of questions applicable for each system are presented in Table 4.

The 19 questions used in ALSDE mandate implementation analysis are provided in Appendix C. Questions included information regarding food and beverage vending, cafeteria menus, fundraising, nutrition and physical activity training for all staff members, creation of a wellness policy, use of an environmental assessment survey during policy creation, and media monitoring. Frequencies for all 19 components are presented in Appendix D. The components of ALSDE mandates most frequently completed were creation of a wellness policy by 100% of the systems and decreased fried foods and increased lower fat options in

the cafeteria reported complete by 121 systems (98%). Increased fruits and vegetables (116 systems or 94%) and increased lower sodium options (106 systems or 86%) in the cafeteria were also frequently completed tasks. The least often completed mandates included use of an assessment survey to evaluate the school health environment (57 systems or 46%) and teacher training in the importance of nutrition and physical activity (66 systems or 54%).

For other mandates, changing beverage vending machine fronts to picture only water or juice had been completed in 95 systems (77% of total or 80% of applicable systems). ALSDE 2005 beverage guidelines had been fully implemented in 109 systems (89% of total). The Channel 1 news system (Ch 1) was monitored in 30 systems (24%) and not applicable (likely unused) in 52 systems (42%), for a total compliance of rate 66%. New fundraising contracts that did not conflict with ALSDE food and nutrition mandates had been negotiated in 94 systems, or 76% of total systems and 93% of applicable systems.

Finally, many systems reported less than 75% of several groups of staff had not attended an in-service on the importance of nutrition and physical activity. Less than 75% of teachers had been trained in 54 systems (44%) (3 systems indicated the mandate was NA). Thirty seven systems (30.2%) indicated less than 75% of administrators had been trained (2 systems NA). Less than 75% of coaches had been trained in 43 systems (35%) (3 NA), less than 75% of counselors had been trained in 49 systems (40%) (4 systems NA), less than 75% of the health staff had been trained in 26 systems (21%) (2 systems NA), and 17 systems (14%) indicated less than 75% of their food service (FS) workers had been trained (0 NA). FS workers should have been trained by CNP personnel; this occurred in 105 systems or 85% of systems (3 systems NA).

Respondents indicated their answers to questions in each section of the survey were applicable to the majority (43-91%) of schools in their systems. Food vending answers applied to 100% of schools in 78 % of applicable systems. Approximately 91% of systems said cafeteria changes were made in 100% of schools. Fundraising changes were made in 100% of schools in 51% of the applicable systems. Lastly, of systems that used Ch1 and had a procedure to monitor it in place, 43% said 100% of their schools were monitoring Ch 1.

Factors Influencing Compliance with Federal Wellness Policies Guidelines and ALSDE Food and Nutrition Mandates

There were no significant differences in federal wellness policy or ALSDE percent compliance grades based on any of the six factors examined: system type, enrollment, percentage of students eligible for free and reduced-price meals, and use of an environmental assessment survey, wellness committee, and a registered dietitian/nutrition degree holder during policy development (Table 5). The lowest p values in federal wellness policy compliance grade analyses existed based on system type ($p=0.163$). The mean percentage grade for city schools was 94%, compared to the average county percentage grade of 89%. The mean percentage score for systems that used an assessment survey was 94%, compared to the 89% score of systems that did not use an assessment survey.

DISCUSSION

This is the first study examining wellness policy compliance and food and nutrition policy implementation in the Southeast. It is the second study to examine wellness policies

within a single state. Findings expand upon those reported by Action for Healthy Kids (AFHK) (2006), the School Nutrition Association (SNA) (SNA 2006a, SNA 2006b, SNA 2007), and Metos and Nanney (2007). This study determined approximately 71% of AL wellness policies reviewed complied fully with all federal guidelines for wellness policies. This finding is comparable to the 78% reported by Metos and Nanney (2007) for 30 public school systems in Utah. Both of these estimates are higher than the 54% reported by the AFHK release that examined 112 wellness policies from 42 states throughout the United States (US) (AFHK 2006). Metos and Nanney (2007) included 75% of all Utah school districts, and this study included 69% of AL systems, while the AFHK release (2006) included policies from many different states. The present study and the Utah study (Metos and Nanney 2007) examined groups of systems operating under the same mandates with similar support resources. Communication among multiple systems included in the same study may also explain higher, or more consistent, grades obtained within state than with random national samples.

In this study, the most frequently addressed components of the federal guidelines were nutrition education (97%) and physical activity (99%). The same was true for both AFHK (2006) and SNA (2007a) releases in which 86% and 97% of policies, respectively, addressed nutrition education goals and 82% and 96% of policies, respectively, addressed physical activity goals. AFHK (2006) findings for other wellness policy components were similar or lower, and the SNA (2006a) findings were typically higher than the present study's findings. Guidelines for nutrition education and physical activity are typically preexisting, long-withstanding requirements addressed through state-approved curriculum.

Although nutrition education and physical activity are not always high curriculum priorities, these are likely more familiar requirements and therefore may be easy to address in written wellness policies. The least addressed policy components were evaluation (80%) and designation of responsible parties for evaluation (79%). Similar percentages for evaluation (81%) and designation of responsible parties (60%) were reported by AFHK (2006). This finding is expected because total wellness policies are relatively new concepts for schools; the evaluation process is not only a new requirement, but may be an unfamiliar task as it could differ from typical academic evaluations.

The topic of competitive foods is commonly addressed in the literature. Ninety-seven percent of AL wellness policies addressed competitive foods generally, compared to 42% of policies in the AFHK report (2006). Specificity of language used was variable, as reported elsewhere (AFHK 2006, SNA 2007), although it was common for policies to address specific outlets for competitive foods. This study found that an average of 62% of policies addressed five common competitive food outlets, compared to 54% in the AFHK release (2006) and 61% in the SNA report (SNA 2006a). Typically for vending, fundraising, and classroom food/celebrations, the present study reported a higher or similar percentage of policies than the AFHK (2006) and SNA (2006a) percentages, whereas food-based reward policies were less common in the present study than in those by AFHK and SNA. In all three studies, vending machines and fundraisers were among the most commonly mentioned competitive food outlets, and classroom food/celebrations was the least commonly addressed competitive food outlet. The typically higher percentage of competitive food policies in the present study may be explained by the existence and specificity of the

ALSDE mandates. ALSDE nutrition mandates include specific competitive foods guidelines. In fact, vending and fundraising activities are addressed separately from other competitive foods in the ALSDE mandates; this emphasis could explain why these outlets were the most commonly addressed outlets.

This study also sought to examine the compliance of AL school systems with ALSDE food and nutrition mandate implementation. The average percentage grade for completing all mandates addressed in this study was 79%. The SNA (2007) issued a survey of nutrition directors in multiple states regarding implementation of Federal wellness policy components. While direct comparisons cannot be made, averaging percentages of responses that indicated complete implementation for each component of the SNA survey provides a total implementation percentage of about 61% for components assessed. Also, Metos and Nanney (2007) reported Utah districts mandated an average of 7 of 32 (22%) possible school health recommendations made by the state. AL systems had implemented an average of 75-89% of ALSDE mandates, depending on the number of applicable mandates per system, demonstrating the strength of ALSDE mandates.

In this study, creation of a wellness policy and changes in the cafeteria were the most commonly completed ALSDE mandates. An average of 94% of systems had implemented cafeteria changes, compared to an average of 79% of systems that had implemented mandates regarding competitive foods. The SNA study also found that competitive food policies were less likely to be implemented than were changes in foods offered through the cafeteria (SNA 2007). The SNA reported the average percentage of systems that had implemented policies for competitive food outlets was 42%, while an average of 75% of

systems had made cafeteria changes. This is reflective of the federal guideline compliance analysis in which USDA meal policies were more commonly addressed than were competitive foods.

In this study, providing nutrition and physical activity training for staff members, especially teachers, and using an assessment survey were the least completed mandates. These requirements are specific to AL school systems; however, the SNA (2007) reported 87% of survey respondents indicated their wellness policies included guidelines for nutrition training for teachers and school nutrition professionals. Only 33% of survey respondents indicated this training had been completed. It is concerning that teachers were least likely to have received training in this study, as students spend the majority of the school day with this staff group. Use of assessment surveys to examine the school health environment has not been examined in the literature. However, completion of assessment surveys and staff training are not part of day-to-day school operations and require time to complete outside of the school day, which may explain the delayed implementation.

Finally, this study sought to determine if factors such as system type, enrollment, free and reduced-meal eligibility, and use of a wellness committee, assessment survey, and RD/nutrition degree holder during policy development influenced school system wellness policy compliance and compliance with ALSDE mandates. No significant differences in wellness policy compliance/ALSDE mandate implementation were found between school systems for any factor analyzed.

The insignificant finding for the influence of school system type (city or county) on percentage grades in this study differs from studies by Brener and others (2003) and Jones

and colleagues (2003) which determined urban schools were more likely than suburban and rural schools to have more health policies in place. While definitions of urban and rural are not identical to that of city and county, location of city and county schools are often in urban and rural settings, respectively, which allows some comparison among the groups.

No significant differences in wellness policy compliance/ALSDE mandate implementation were found between school systems based on enrollment and percentage of students eligible for free and reduced-price school meals. Metos and Nanny (2007) also reported no difference in compliance with federal guidelines based on enrollment or free and reduced- price meal eligibility in Utah school systems.

Brener and others (2004) reported a difference in existence of some health policies in schools with and without health councils prior to the creation of wellness policies. However, the present study found no significant difference in percentage grades based on use of a wellness committee. Brener and coworkers (2004) reported existence of wellness committees or health councils did not negatively impact school policies, but did not guarantee policy existence or implementation. Wellness committees may be of greater importance in wellness policy evaluation and revision processes to come. The same may be true for the final factors examined in this study: use of an environmental assessment survey for policy development and involvement of registered dietitians (RDs) or professionals with nutrition degrees. These two factors are not currently examined in the literature.

Limitations of this study include possible variations in the interpretation of the federal guidelines. Also, literature regarding wellness policies and the implementation of health-related policies is limited, which restricts comparison of results. While this study was

conducted similarly to previous studies, no validated tool for wellness policy assessment exists. To compensate, this study examined compliance with federal guidelines alone and did not examine policy quality. While this method does not provide an in-depth view of wellness policies, it provides a good first look. If systems cannot address basic components as required by the federal law, the ultimate impact of the policies may be questionable.

Another limitation was use of a survey that relied on respondents' estimates of policy implementation for their entire system. Because the surveys were not anonymously completed, the implication that ALSDE would receive the study results may have resulted in intentional misrepresentation. Superintendents are responsible for day-to-day school system decisions and policy implementation and were therefore the survey targets; however, Child Nutrition Program directors were frequent respondents. They are responsible for administration of school meal programs and would have insight into nutrition policy information in districts. Despite limitations, a survey is the most feasible way to gather this amount of information; visiting each school would require numerous resources, and direct observation may not provide clear indication of progress as each system and each school within the system may operate differently. Also, the response rate to the survey (93%) was much higher than that reported by the SNA (28%) (SNA 2007). The high response rate and the percentage of total policies evaluated (69%) suggest this study provides a good representation of wellness policies and ALSDE mandate implementation for the entire state. The likelihood of non-responsive systems to have complied with all federal guidelines for wellness policies and implemented all ALSDE mandates is questionable; therefore these results may be the best possible representation of AL school systems.

In conclusion, AL school systems did well creating wellness policies with appropriate content; the majority of systems were in full compliance with federal guidelines for wellness policies. However, this does not guarantee good quality or effective policy. The lack of specific language used in some policies may limit the impact of wellness policies on AL students' health. Detailed ALSDE food and nutrition mandates have required positive changes in the school environment, and likely aided wellness policy development as many school systems included these mandates in their wellness policies. However, AL systems have not done as well implementing ALSDE mandates, demonstrating a delay in the creation of school health policies and their implementation. Finally, factors influencing successful policy creation and expedient implementation are still largely unknown. Future research is needed regarding progress school systems make in implementation of school health mandates, and on the factors influencing that progress.

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Table 1: Federal Wellness Policy Compliance Raw and Percentage Score Frequencies

Raw Score (of 7) (Percentage Score)	**Frequency (of 91)**	**Percent of Sample (of 100%)**
1 (14%)	1	1.1
2 (29%)	1	1.1
3 (43%)	1	1.1
4 (57%)	2	2.2
5 (71%)	12	13.2
6 (86%)	9	9.9
7 (100%)	65	71.4
Mean = 6.41(92%)		

Table 2: Frequencies of Federal Guideline Wellness Policy Components Addressed in Present Study, Compared with Literature Reports

Federal Component	**Present Study: Number (%) of Policies Addressing (of 91 systems)**	**AFHK: % of Policies Addressing (of 100%)**	**SNA: % of Policies Addressing (of 100%)**
Nutrition Education	88 (97%)	86*	97*
Physical Activity	90 (99%*)	82	96
Competitive Foods (General)	88 (97%)	42[+]	NA
School Meals	85 (93%)	75	97*
Evaluation	73 (80%)	81	95[+#]
Responsible Party	72 (79%[+])	60	95[+#]
Wellness Committee	87 (96%)	61	NA

* Most addressed component

[+] Least addressed component

[#] 95% had an implementation/evaluation plan with responsible parties designated

Table 3: Frequencies of Common Competitive Food Outlets Addressed in Federally Mandated Wellness Policies in Present Study, Compared with Literature Reports

Competitive Food Outlet	**Present Study: Number (%) of Policies Addressing (of 91)**	**AFHK: Percent of Policies Addressing (of 100 %)**	**SNA: Percent of Policies Addressing (of 100%)**
À la carte	50 (55%)	45	65*
Vending	67 (74%)	66*	65*
Fundraising	70 (77%*)	59	62
Classroom Food/Celebrations	48 (53%$^{+}$)	40^{+}	53^{+}
Food as Reward	48 (53%$^{+}$)	60	58
Mean	56.6 (62%)	54	61

* Most addressed outlet
$^{+}$ Least addressed outlet

Table 4: ALSDE Mandate Implementation Grades by Number of Applicable Questions

Number of Questions Applicable*	**Frequency (of 123)**	**Min Raw Score (Percentage Grade)**	**Max Raw Score (Percentage Grade)**	**Mean Raw Score (Percentage Grade)**
19	57	3 (16%)	18 (95%)	14.3/75%
18	43	7 (39%)	18 (100%)	14.8/82%
17	15	9 (53%)	17 (100%)	13.7/81%
16	5	9 (56%)	16 (100%)	13.4/84%
15	1	12 (80%)	12 (80%)	12.0/80%
14	2	12 (86%)	13 (93%)	12.5/89%

***** When survey respondents indicated mandates were not applicable in their schools, the questions were excluded from the potential scores/grades, creating different question totals (14-19) used in calculations.

Table 5: The Impact of Multiple School Factors on Federal Wellness Policy and ALSDE Food and Nutrition Mandate Percentage Grades

Factor	Federal Evaluation (n) (of 91)	Federal Percentage Grade (Mean ± SD)	ALSDE Evaluation (n) (of 123)	ALSDE Percentage Grade (Mean ± SD)
System Type				
City	46	94.0 ± 13.8	62	80.1 ± 17.0
County	45	89.1 ± 18.6	61	78.1 ± 15.9
Enrollment				
≤ 4999 students	63	90.5 ± 18.3	86	80.0 ± 16.7
≥ 5000 students	28	93.9 ± 11.3	37	76.9 ± 15.9
% Students Eligible for Free/Reduced Meals				
≤50%	35	91.4 ± 17.0	44	80.6 ± 12.0
>50%	56	91.6 ± 16.3	79	78.2 ± 18.4
Assessment Survey				
Yes	43	94.0 ± 10.9	57	80.3 ± 17.1
No	48	89.3 ± 20.1	65	78.0 ± 16.0
Wellness Committee				
Yes	87	91.8 ± 16.8	117	79.6 ± 16.5
No	4	85.7 ± .000	5	67.9 ± 14.2
RD/Nutrition Degree Holder				
Yes	42	93.3 ± 15.2	67	80.0 ± 16.1
No	49	89.5 ± 17.9	55	78.0 ± 17.1

CHAPTER IV

SUMMARY OF FINDINGS

The percentage of Alabama (AL) school systems addressing all components of the Child Nutrition and WIC Reauthorization Act of 2004 was less than 80%, thus supporting hypothesis one. The percentage of AL school systems reporting implementation of all Alabama State Department of Education (ALSDE) food and nutrition mandates was less than 80%. This finding supports the second research hypothesis.

There were no significant differences in percent compliance with federal wellness policy guidelines or ALSDE mandate implementation based on any of the six factors examined: system type, enrollment, percentage of students eligible for free and reduced-price meals, and use of an assessment survey, wellness committee, and registered dietitian or nutrition degree holder in wellness policy development. These findings do not support research hypotheses three through eight.

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APPENDICES

APPENDIX A

FEDERAL WELLNESS POLICY GRADES BY SCHOOL SYSTEM

Federal Wellness Policy Compliance Grades by School System

System Name	Raw Score (of 7)	Percentage Grade (of 100)
Albertville City	7	100
Alexander City	7	100
Andalusia City	7	100
Anniston City	7	100
Arab City	7	100
Athens City	7	100
Attala City	5	71
Auburn City	6	86
Autauga County	7	100
Baldwin County	7	100
Bessemer City	7	100
Bibb County	7	100
Birmingham City	7	100
Brewton City	2	29
Bullock County	7	100
Calhoun County	5	71
Clarke County	7	100
Cleburne County	4	57
Coffee County	3	43
Conecuh County	6	86
Coosa County	7	100
Covington County	7	100
Crenshaw County	4	57
Cullman City	7	100
Cullman County	7	100
Dallas County	7	100
Decatur City	7	100
DeKalb County	5	71
Demopolis City	7	100
Elba City	7	100
Elmore County	5	71
Enterprise City	7	100
Escambia County	1	14
Etowah County	5	71
Eufaula City	7	100
Fayette County	7	100
Franklin County	7	100
Geneva City	7	100
Geneva County	7	100
Guntersville City	7	100

System Name	Raw Score (of 7)	Percentage Grade (of 100)
Hale County	7	100
Haleyville City	7	100
Hartselle City	7	100
Henry County	6	86
Homewood City	5	71
Hoover City	7	100
Houston County	7	100
Huntsville City	7	100
Jackson County	7	100
Jacksonville City	6	86
Jasper City	7	100
Lamar County	7	100
Lauderdale County	7	100
Lawrence County	5	71
Linden City	7	100
Lowndes County	7	100
Madison City	7	100
Madison County	6	86
Marengo County	6	86
Marion County	7	100
Marshall County	7	100
Mobile County	7	100
Montgomery County	7	100
Morgan County	7	100
Mountain Brook City	6	86
Oneonta City	7	100
Opelika City	6	86
Oxford City	5	71
Phenix City	7	100
Pike County	5	71
Randolph County	7	100
Roanoke City	5	71
Russell County	7	100
Russellville City	6	86
Selma City	7	100
Sheffield City	7	100
Shelby County	7	100
St. Clair County	7	100
Sumter County	6	86
Sylacauga City	7	100
Talladega City	7	100
Tarrant City	7	100

System Name	Raw Score (of 7)	Percentage Grade (of 100)
Thomasville City	7	100
Troy City	5	71
Trussville City	7	100
Tuscaloosa County	7	100
Tuscumbia County	7	100
Walker County	7	100
Wilcox County	7	100
Winfield City	7	100
Winston County	5	71

APPENDIX B

ALSDE MANDATE IMPLEMENTATION GRADES BY SCHOOL SYSTEM

ALSDE Mandate Implementation Grades by System

System Name	Raw Score	Percentage Grade (of 100%)
Albertville City	15/19	79
Alexander City	14/19	74
Andalusia City	18/18	100
Anniston City	15/18	83
Arab City	15/18	83
Athens City	13/19	68
Attala City	7/18	39
Auburn City	16/16	100
Autauga County	14/19	74
Baldwin County	12/14	86
Barbour County	16/17	94
Bessemer City	11/19	58
Bibb County	18/19	95
Birmingham City	11/17	65
Blount County	17/18	94
Boaz City	17/19	89
Brewton City	15/17	88
Bullock County	12/19	63
Calhoun County	12/15	80
Chambers County	15/18	83
Cherokee County	16/19	84
Chilton County	17/19	89
Clarke County	17/18	94
Clay County	12/18	67
Cleburne County	17/18	94
Coffee County	16/18	89
Conecuh County	9/19	47
Coosa County	3/19	16
Covington County	16/17	94
Crenshaw County	14/18	78
Cullman City	12/19	63
Cullman County	11/18	61
Dale County	15/19	79
Dallas County	8/19	42
Decatur City	17/18	94
DeKalb County	13/19	68
Demopolis City	11/19	58
Dothan	4/19	21
Elba City	9/16	56
Elmore County	15/19	79

System Name	Raw Score	Percentage Grade (of 100%)
Enterprise City	15/18	83
Escambia County	15/19	79
Etowah County	13/19	68
Eufaula City	12/16	75
Fairfield City	17/18	94
Fayette County	17/18	94
Florence City	18/18	100
Fort Payne City	18/19	95
Franklin County	17/18	94
Gadsden City	18/19	95
Geneva City	10/19	53
Geneva County	16/18	89
Greene County	14/18	78
Guntersville City	13/17	76
Hale County	17/18	94
Haleyville City	15/18	83
Hartselle City	12/19	63
Henry County	15/19	79
Homewood City	13/18	72
Hoover City	12/18	67
Houston County	17/19	89
Huntsville City	11/18	61
Jackson County	15/16	94
Jacksonville City	15/17	88
Jasper City	18/19	95
Lamar County	17/19	89
Lanett City	17/17	100
Lauderdale County	17/19	89
Lawrence County	11/19	58
Lee County	15/19	79
Leeds City	15/17	88
Limestone County	15/19	79
Linden City	15/19	79
Lowndes County	13/19	68
Macon County	11/19	58
Madison City	9/17	53
Madison County	12/19	63
Marengo County	15/18	83
Marion County	13/18	72
Marshall County	17/19	89
Midfield City	11/17	65
Mobile County	13/19	68

System Name	Raw Score	Percentage Grade (of 100%)
Monroe County	15/19	79
Montgomery County	15/19	79
Morgan County	14/19	74
Mountain Brook City	12/18	67
Muscle Shoals City	17/18	94
Oneonta City	18/18	100
Opelika City	13/14	93
Opp City	13/19	68
Oxford City	14/18	78
Ozark City	17/18	94
Phenix City	16/19	84
Piedmont City	17/19	89
Pike County	17/19	89
Randolph County	18/19	95
Roanoke City	17/19	89
Russell County	10/18	56
Russellville City	17/19	89
Scottsboro City	16/18	89
Selma City	18/18	100
Sheffield City	18/18	100
Shelby County	15/18	83
St. Clair County	12/18	67
Sumter County	15/17	88
Sylacauga City	15/16	94
Talladega City	16/19	84
Talladega County	18/19	95
Tallapoosa County	13/18	72
Tallassee City	18/18	100
Tarrant City	12/19	63
Thomasville City	16/19	84
Troy City	17/17	100
Trussville City	12/17	71
Tuscaloosa City	10/17	59
Tuscaloosa County	14/19	74
Tuscumbia County	18/19	95
Vestavia Hills City	17/19	89
Walker County	17/18	94
Washington County	8/18	44
Wilcox County	18/19	95
Winfield City	14/17	82
Winston County	13/18	72

APPENDIX C

SURVEY QUESTIONS ANALYZED AND GRADING SCHEME

School Wellness Survey[*]

4. Have schools in your system reviewed their offerings of foods in the vending machines and school stores?
○ No, we have not begin to review our food offerings (0 points)
○Yes, but no additional review of food offerings has been conducted since Summer 2006 (0 points)
○Yes, and additional review of food offerings has been conducted since Summer 2006 (0 points)
○Yes, all reviews of food offerings are complete (1 point)
○ Not applicable (Exclude question)

5. Have schools in your system begun to phase out low nutritive foods sold in vending machines and school stores and phase in high nutritive foods?
○ No, we have not begun to phase out low nutritive foods and phase in high nutritive foods (0 points)
○ Yes, but no changes have been made since Summer 2006 (1 point)
○ Yes, and additional changes have been made since Summer 2006 (1 point)
○ Yes, phasing out low nutritive foods and phasing in high nutritive foods is complete (1 point)
○ Not applicable (Exclude question)

7. Other than vending machines in high school athletic arenas, have the vending machine fronts been changed as recommended to picture only water or fruit juices?
○ No, we have not begun to change vending machine fronts (0 points)
○ Yes, but no changes have been made since Summer 2006 (0 points)
○ Yes, and additional changes have been made since Summer 2006 (0 points)
○ Yes, all applicable vending machine fronts now picture water or fruit juice (1 point)
○ Not applicable (Exclude question)

8. What percentage of schools in your system has fully implemented the 2005 State Department of Education guidelines for beverage vending in elementary, middle, and high schools?
○ 0-25% (0 points)
○ 26-50% (0 points)
○ 51-75% (0 points)
○ 76-99% (0 points)
○ 100% (1 point)
○ Not applicable (Exclude question)

[*] Survey questions and answers are presented as they appeared on the survey, with the grading scheme included in parentheses following each potential answer. Only one answer choice could be selected per question.

9. Do the cafeteria menus offer more fruits and vegetables?
○ No, we have not reviewed the menus at this time (0 points)
○ No, the menus offer fewer fruits and vegetables now than during the 2005-2006 school year (0 points)
○ No, the menus offer the same amount of fruits and vegetables now as during the 2005-2006 school year (0 points)
○ Yes, fruit and vegetable offerings have increased since the 2005-2006 school year (1 point)
○ Not applicable (Exclude question)

10. Do the cafeteria menus offer more lower fat food choices?
○ No, we have not reviewed the menus at this time (0 points)
○ No, the menus offer fewer lower fat items than during the 2005-2006 school year (0 points)
○ No, the menus offer the same amount of lower fat items now as during the 2005-2006 school year (0 points)
○ Yes, lower fat food offerings have increased since the 2005-2006 school year (1 point)
○ Not applicable (Exclude question)

11. Do the cafeteria menus offer more lower sodium food choices?
○ No, we have not reviewed the menus at this time (0 points)
○ No, the menus offer fewer lower sodium choices now than during the 2005-2006 school year (0 points)
○ No, the menus offer the same amount of lower sodium choices now as during the 2005-2006 school year (0 points)
○ Yes, lower sodium food offerings have increased since the 2005-2006 school year (1 point)
○ Not applicable (Exclude question)

12. Do the cafeteria menus offer fewer fried items?
○ No, we have not reviewed the menus at this time (0 points)
○ No, the menus offer more fried choices now than during the 2005-2006 school year (0 points)
○ No, the menus offer the same amount of fried choices now as during the 2005-2006 school year (0 points)
○ Yes, fried food offerings have decreased since the 2005-2006 school year (1 point)
○ We do not fry foods in our cafeterias (1 point)
○ Not applicable (Exclude question)

14. Have schools in your system negotiated new contracts for fundraiser activities that do not conflict with State Department of Education recommendations?
○ No, we have not begun to negotiate new contracts (0 points)
○ Yes, we have begun negotiating new contracts, but no changes have been made since Summer 2006 (1 point)
○ Yes, we have begun negotiating new contracts and changes have been made since Summer 2006 (1 point)
○ Yes, negotiation of new contracts is complete (1 point)
○ Not applicable (Exclude question)

22. What percentage of the following staff members has attended an in-service on the importance of nutrition and physical activity? (One point for each staff group or six potential points.)

a. Administrators
b. Teachers
c. Coaches
d. Counselors
e. School health personnel
f. Food service personnel

Potential answers for each staff group listed above:
○ 0-25% (0 points)
○ 26-50% (0 points)
○ 51-75% (0 points)
○ 75-99% (1 point)
○ 100% (1 point)
○ Not applicable (Exclude question)

23. If food service personnel have received training, was it from a qualified Child Nutrition Program (CNP) director?
○ Yes (1 point)
○ No (0 points)
○ Not applicable (Exclude question)

24. Has your school system submitted a local wellness policy to the State Department of Education within the past 2 years?
○ Yes (1 point)
○ No (0 points)

30. During wellness policy development, did your school system use a nationally recognized, validated survey to identify school environment strengths and weaknesses?
○ Yes (1 point)
○ No (0 points)

32. Has your school system developed a procedure to monitor Channel One broadcasts?
○ No, we have not developed a procedure to monitor Channel One (0 points)
○ Yes, we have developed a procedure to monitor Channel One but it is not yet implemented (0 points)
○ Yes, we have developed and implemented a procedure to monitor Channel One (1 point)
○ Not applicable (Exclude question)

APPENDIX D

SURVEY RESPONSE FREQUENCIES

Survey Response Frequencies

Question	n Complete (Percent of Sample)	n Incomplete (Percent of Sample)	n NA (Percent of Sample)	n Total
4	71 (58)	49 (40)	3 (2)	123
5**	118 (96)	1 (1)	4 (3)	123
7	95 (77)	24 (20)	4 (3)	123
8	109 (89)	14 (11)	0	123
9	116 (94)	7 (6)	0	123
10	121 (98)	2 (2)	0	123
11	106 (86)	17 (14)	0	123
12	121 (98)	2 (2)	0	123
14**	94 (76)	7 (6)	22 (18)	123
22[#]a	84 (68)	37 (30)	2 (2)	123
22b	66 (54)	54 (48)	3 (2)	123
22c	77 (63)	43 (35)	3 (2)	123
22d	70 (57)	49 (40)	4 (3)	123
22e	95 (77)	26 (21)	2 (2)	123
22f	106 (86)	17 (14)	0	123
23	105 (85)	16 (13)	2 (2)	123
24*	123 (100)	0	0	123
30[+]	57 (46)	65 (53)	0	122[a]
32	30 (24)	40 (33)	52 (43)	122[a]

* Most often completed
[+] Least often completed
** Credit given for indication of any progress made toward implementation
[#] Credit given if respondents indicated ≥75% of each staff group had attended an in-service
[a] One system excluded due to unavailable survey information.

4. Reviewed food offerings in the vending machines and school stores.
5. Begun to phase out low nutritive foods in vending machines and school stores and phase in high nutritive foods.**
7. Applicable vending machine fronts changed to picture water or juice.
8. One hundred percent of schools fully implemented the 2005 ALSDE beverage guidelines.
9. Cafeteria menus offer more fruits and vegetables.
10. Cafeteria menus offer more lower fat food choices.
11. Cafeteria menus offer more lower sodium food choices.
12. Cafeteria menus offer fewer fried items.
14. Negotiated new contracts for fundraiser activities**.
22. Staff attended a nutrition and physical activity in-service[#.] (a. administrators, b. teachers, c. coaches, d. counselors, e. health staff, f. food service staff)
23. Food service staff received training from a qualified Child Nutrition Program (CNP) director.
24. Submitted a wellness policy to ALSDE within the past 2 years.
30. Used an assessment survey during wellness policy development.
32. Developed a procedure to monitor Channel One broadcasts.