What are the causes and outcomes of obesity for young children? This article presents strategies and provides resources for children, teachers, and families to work together to halt this alarming trend.

Children, Teachers, and Families Working Together to Prevent Childhood Obesity: Intervention Strategies

Dolores A. Stegelin

The causes and implications of obesity, as well as the solutions, are complex and interrelated. Ironically, childhood overweight and obesity is developing within a social context in the United States that values thinness, physical prowess, and athletic ability. Early childhood professionals and families can work together toward obesity prevention. They can also coordinate efforts to intervene with young children so that similar healthy strategies are used in both the home and classroom. Three critical areas of intervention are discussed in this article:

- nutrition and environment,
- level of physical activity, and
- psychological support and intervention.

Childhood obesity leads to adult obesity.

What Is the Problem?

Obesity rates for children, adolescents, and adults continue to escalate in the United States and globally (American Obesity Association, 2005; Moran, 1999). Educators, health specialists, psychologists, and sociologists are studying the complex problems related to early obesity. Like other health problems, prevention and early detection are the most effective strategies.

Why should we be so concerned about overweight and obese young children? The emerging medical and psychological data on childhood obesity points to the long-term consequences of obesity. These findings underscore the need to control weight problems now so that every generation can live long and healthful lives. The obesity problem has taken decades to develop and, realistically, it will take many years to understand and control.

Behaviors involving physical activity and nutrition are the cornerstone of preventing obesity in children and adolescents. Families and schools are the two most critical links in providing the foundation for those behaviors (American Obesity Association, 2005). Obesity is an issue that demands well-informed and responsible responses from all early childhood educators and parents (Jalongo, 1999).

Evidence of Childhood Obesity

Being overweight or obese means that a person is heavier than average (Jalongo, 1999), and there are several ways to define or determine whether or not a child fits this category. A child's status can be determined through standard procedures that include average weight-for-height measures. BMI (body mass index) is a ratio based on body mass and height. The measure is currently used globally.

- *Overweight* refers to BMI measures from 25 to 30 (19 to 25 is considered healthy). Obesity, on the

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Successful obesity prevention focuses on nutrition, diet, and the environment; increased levels of physical activity; and psychological support and intervention.

other hand, is defined as a body weight greater than 120% of the average weight for a given height, gender, age, and bone structure or a body mass index greater than the 95th percentile (American Obesity Association, 2005; Moran, 1999; Neuman & Jenks, 1992).

- *Obesity* is defined as a body mass index (BMI) of more than 30, and the higher the BMI index, the more obese is the child. There are degrees of obesity ranging from mild to morbid.

Numerous indicators document the rising rates of childhood obesity in the United States:

- from 1976 to 1980, approximately 7% of children were obese (defined as BMI greater than 95th percentile);
- from 1988 to 1994, 11% of children were obese, and
- by 2000 the rate was 15.3% (American Obesity Association, 2005).

Another compelling fact is that the number of children who are overweight has doubled in the last 3 decades (American Obesity Association, 2005; Moran, 1999; Torgan, 2002). While 25 to 30% of U.S. children are overweight or obese, the condition is under-diagnosed and under-treated (American Obesity Association, 2005; Moran, 1999; Torgan, 2002).

The U.S. is not alone in the obesity epidemic (Moran, 1999; Schwartz & Puhl, 2003). England reports that its childhood obesity rates have doubled since 1982. Canada reports that more than one-third of Canadian children ages 2 to 11 are overweight, and half of those are obese. In Australia, a 2000 study found that both boys and girls were twice as likely to be defined as overweight in 2000 as in 1985 (Eberstadt, 2003). Children in Italy are more likely to be obese than those in France, Holland, the United States, England, and Scotland. In Germany, researchers are reporting patterns of overweight and obesity comparable to other European countries (Eberstadt, 2003).

Because the childhood obesity problem is a major global issue, children around the world can benefit from collaborative international research and intervention strategies.

What Are the Causes of Obesity?

Obesity is a complex issue, and the causes of obesity vary from child to child. Some common variables exist, but not all obese children necessarily eat significantly more or differently than thinner children (Satter, 1999). Obesity causes are either modifiable or non-modifiable (American Obesity Association, 2005).

Indicators of childhood overweight and obesity found in common social settings.

- Children's clothing is marketed in "husky" and size-and-a-half options.
- Spandex and fleece are popular in clothes because they adapt to a rapidly expanding size (Eberstadt, 2003).
- Autos in the U.S. feature extra-large cup holders and enlarged seating space to accommodate heavier adults and children.
- Airlines are charging additional fees to defray the cost of fuel required to fly heavier passengers.
- While the fast food industry has received criticism for oversized food portions and aggressive marketing strategies, the fact remains that consumers demand, and get, larger portions. Soft drinks, sold originally in 8-ounce quantities, are marketed today as super-sized soft drinks of 46 to 64 ounces. Hamburgers and French fries are sold in portion sizes two to three times the fast food menu options of 20 years ago (Torgan, 2002). Most fast food items come in three different sizes with only a modest charge for more.

- *Modifiable* causes are those that can be changed and include 1) levels of physical activity, 2) sedentary behaviors, 3) socio-economic status, 4) eating habits, and 5) environmental factors.
- *Non-modifiable* causes include genetics.

Most experts agree that obesity, especially in early childhood, is caused by several primary factors that include:

- ***Emotional factors:*** Feeling unsafe or experiencing stress can cause children to overeat, view food as emotionally com-

forting, or eat too quickly. Stress seems to be a contributing factor to overeating in the U.S. Sources of stress can originate in the home, school, or neighborhood (Bosch, Stradmeijer, & Seidell, 2001).

- ***Hereditary factors:*** Rates of metabolism, a tendency to store calories as excess fat, and ethnic differences may impact body size and weight (Jalongo, 1999). Research also shows a link between maternal obesity and childhood obesity (Jalongo, 1999; Neuman & Jenks, 1992).
- ***Physical activity levels:*** Sedentary lifestyles contribute to obesity. Many contemporary families and classrooms are preoccupied with television, computers, and other technology-driven devices that require prolonged sitting or sedentary routines. Safety concerns also contribute to more limited physical activity in the neighborhood and community.
- ***Lifestyle factors:*** Family meal patterns are irregular and more likely to be fast-food oriented. Families who eat "on the run" are more likely to consume prepackaged or fast-food meals that often contain more calories and fat. They also have less time to spend around the family dinner table and to engage in more healthful eating habits. Evidence of lifestyle changes are cited by Eberstadt (2003) who states that people born in 1964 who became obese did so about 25 to 27% faster than those born in 1957.

These causes reflect complex patterns of behavior that have developed over several decades. They will take time to modify. Heredity represents the least controllable variable, but the combined effects of nonheredity variables are perhaps the most significant.

Subjects & Predicates

Effective childhood obesity prevention and intervention strategies require consistent and focused adult supervision and support. Teachers and families must work together for these strategies to be effective.

What Are the Consequences of Childhood Obesity?

The consequences of childhood obesity are numerous and cut across several domains of child development. Emerging research indicates that obesity typically leads to negative physical, psychological, and social outcomes.

Model healthful eating habits.

Health Problems

Obesity presents a variety of health problems for children. It is the leading cause of pediatric hypertension and Type II diabetes, increases the risk of coronary heart disease, increases stress on weight-bearing joints, contributes to lower self-esteem, and negatively impacts relationships with peers (American Obesity Association, 2005; Blasi, 2003; Moran, 1999).

Over the long term, childhood obesity leads to adult obesity, with research indicating that an obese 6-year-old is 50% more likely to be an obese adult (Blasi, 2003). Childhood obesity-related health problems evolve into increased risk for chronic health problems in adulthood. One of the serious health problems related to obesity for adults is sleep apnea (interrupted breathing while sleeping), which, in some cases, can lead to problems with learning and memory (Torgan, 2002).

Other long-term adult outcomes of childhood obesity include employment and social discrimination, depression, and lowered self-esteem, believed to be associated with years

of teasing, bullying, and social discomfort (Blasi, 2003; Schwartz & Puhl, 2003; Strauss, 2000).

These outcomes can diminish the quality and success of life during childhood and adulthood. A summary of key outcomes related to obesity, and substantiated by research, is found in Table 1.

Prevention and Intervention Strategies

Schools and child care centers educate and care for millions of children daily, so they hold tremendous potential to help solve the childhood obesity problem. Many children eat breakfast and lunch at school or in child care, representing a significant portion of their daily food intake. Effective prevention and intervention strategies require consistent and focused adult supervision and support. Teachers and families must work together for these strategies to be effective.

The Child Nutrition and WIC Reauthorization of 2004 (P.L. 108-265) requires every school district to produce a local wellness policy that addresses nutrition education; guidelines for reimbursable school meals; plans for measuring implementation of the local wellness policy; and involvement by parents, students, the school board, school administrators, and the public (Bosch et al., 2001; Litchfield & Nelson, 2005). Many schools developed innovative programs to intervene with and model positive and healthy eating habits for children (Centers for Disease Control, 2000).

The National Association of State Boards of Education (NASBE) provides resources for developing school wellness policies (Litchfield & Nelson, 2005). The American Academy of Pediatrics makes dietary and health practice recommendations for child care centers to help address the obesity problem (see Online Resources).

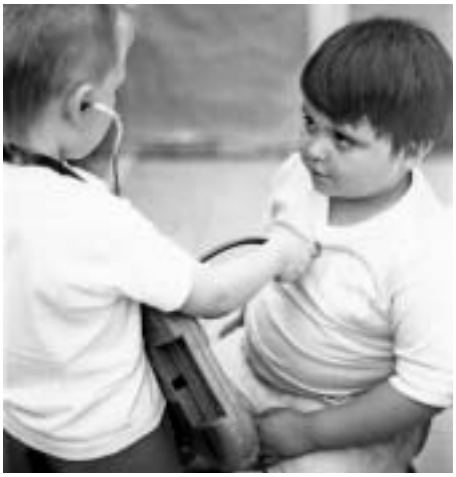
School- and Center-Based Strategies

Obesity prevention and intervention strategies for school and child care settings should focus on three areas:

- nutrition, diet, and the environment
- levels of physical activity
- psychological support and intervention

Table 1. Summary of key outcomes related to obesity.

Obesity-Related Outcomes for Children	Significance of Findings
1. Increased pulmonary, cardiovascular, Type II diabetes, and other health problems	❑ Early-onset obesity is directly related to serious diseases of the lungs, heart, and cardiovascular system. These conditions were formerly seen more in the adult population (American Obesity Association, 2005; Torgan, 2002).
2. Deep-seated social stigma	❑ Limiting intervention to only the physical dimensions can create a negative psychological cycle for the young child. Intervention should focus on the whole child (Christie, 2003; Moran, 1999).
3. Lowered self-esteem and related childhood depression	❑ Early research shows a link between childhood obesity and lowered self-esteem that can contribute to early childhood depression (Blasi, 2003; Fabricatore & Wadden, 2004). More research is needed. ❑ Childhood obesity erroneously may be viewed as a reflection of poor character rather than seeing the child as medically compromised (Jalongo, 1999). There are no quick or easy solutions to childhood obesity.
4. Social isolation and peer exclusion	❑ The "fat is bad" stigma appears early in life, and children as young as 3 years have been seen to show favor to average-weight peers rather than "chubby" peers (Costante, 2002; Fabricatore & Wadden, 2004.
5. Academic decline	❑ Children who are under peer scrutiny and criticism expend emotional energy to preserve their integrity and defend themselves (Costante, 2002). They have less energy to focus on higher-level responses required for academic success.
6. Bias and discrimination	❑ Even health professionals and well-educated adults project implicit stereotypes of lazy, stupid, and worthless onto obese children and adolescents, a pervasive and powerful stigma (Schwartz, 2003).



Elisabeth Nichols

The disparaging comments frequently made about overweight children would not be tolerated if they focused on other human characteristics. Target the stigma issue by not tolerating classroom teasing, bullying, and negative responses from peers.

Food and the Environment

This comprehensive approach combines serving healthy meals **and** an educational component that makes nutrition education interesting and relevant for children. In addition, creating a supportive school environment is essential. Many schools are removing vending machines and other sources of unhealthy foods (candy bars and soft drinks), and are establishing more relaxed meal schedules (Mudder & Konarik, 2004).

Encourage adequate levels of physical activity.

A critical part of a supportive school environment is psychological support. Making changes in habits and attitudes requires professional understanding, monitoring, and therapeutic intervention. Thus, teachers, administrators, and parents must work together in this important and essential element of holistic intervention.

Recess and Physical Activity

Despite the obvious necessity for increased physical activity, efforts to improve physical education have been less successful than dietary initiatives. Physical education, for example, is required for the entire school in only about 8% of elementary schools, 6.4% of middle schools, and 5.8% of high schools (Burgeson, Wechsler, Brener, Young, & Spain, 2001).

The reduction or elimination of recess in elementary schools is taking

Table 2. Obesity Prevention and Intervention Strategies for Collaboration Among Teachers and Parents

Nutrition and Environmental Strategies

- Assess the eating climate and determine if it is relaxed, congenial, and socially accepting. Are eating environments pleasant. Do they encourage conversation and relaxed eating habits?
- Reduce the availability of extra foods in the form of snacks, vending machine options, and in-class special events. Meals should meet the USDA nutrition standards as well as provide food choices that reflect cultural and ethnic diversity and preferences.
- Observe and document the emotional and psychological climate of the school or center. Be alert to, and work to reduce, peer and teacher attitudes and behaviors that stigmatize obesity.
- Survey parents and teachers to determine if adequate psychological support and intervention services are available in the school or center. Speak out against bullying and teasing.
- Recognize the connection between body size and self-esteem. View the obesity issue holistically and intervene with the "whole" child.
- Work with policy makers. All children should have access to breakfast and lunch periods that are sufficient in length of time, do not require waiting, and are in the middle of the day.

Teaching and Curriculum Strategies

- Review curriculum materials and books for sensitivity to overweight and obese children. These materials should be inclusive and demonstrate accepting attitudes toward all children, regardless of body size. Model positive attitudes toward different body types.
- Document that teachers and professional staff have formal and appropriate nutritional and physical activity training.
- Require all children to participate in daily recess, physical activity, and health education curriculum. Advocate for active and routine outdoor play and recess. Discourage withholding of recess or play time as a form of punishment.
- Integrate kinesthetic and physical movement into the daily curriculum. For example, encourage children to "demonstrate" concepts by moving their arms, legs, and bodies.

Teacher-Parent Collaboration Strategies

- Model appropriate habits and attitudes toward eating, healthy foods, and physical activity through special projects, walks, and food festivals that emphasize healthy eating and exercise habits.
- Encourage non-competitive lifestyles that incorporate walking, bicycling, hiking, camping, and other physical activities. Plan events that model a positive attitude toward physical activities.
- Engage volunteers in the classroom to model healthy eating and physical activity habits and attitudes.
- Set realistic goals and realize that behavioral changes such as eating habits and physical activity patterns require time to implement.

place because of mandates for heavier academic curriculum and other time demands on classroom teachers. If children do not have the opportunity to be active during the regular school schedule, they tend not to compensate after school. According to Dale, Corbin, & Dale (2000), children were less active after school on days when they had no recess and PE classes in school. Some schools are introducing physical education as a "new PE" by mimicking a health club approach with a focus on individual fitness goals and weight training instead of competitive sports.

Psychological Effects

A final and critical piece of the child obesity puzzle is the need for teachers, administrators, and families to band together to address the psychological effects of obesity, including childhood depression and lowered self-esteem (Schwartz & Puhl, 2003; Strauss, 2000). The disparaging comments frequently made about overweight children would not be tolerated if they focused on other human characteristics (Jalongo, 1999).

Schools and child care centers can target the stigma issue by not tolerating classroom teasing, bullying, and negative responses from peers. "These strategies are no different than those to help any child with a disability or health challenge to feel good about themselves" (Costante, 2002, p. 39).

Primary school teachers report that many girls are concerned about their weight and body image as early as first or second grade. Ethnic and cultural considerations are important also, as African American and Latino children have higher rates of overweight and obesity (Berg, 1997; Jalongo, 1999). Attitudinal issues related to obesity are critical, and this may be the one intervention component that is most lacking in school and center-based programs related to obesity. Obesity may even be a source of discrimination in early childhood classrooms (Jalongo, 1999).

Table 3. Family Strategies to Prevent Obesity

Be Active!

a) Make time for the whole family to regularly walk, bicycle, roller skate, and play together actively.
b) Assign vigorous chores to every family member such as vacuum, load and unload the dishwasher, wash the dog, mow the lawn, dust the furniture, fold laundry, and wash the car. Rotate chore assignments.
c) Encourage children to try a new sport at school or on an intramural, community-based team. Sign up the family for softball or other team sports.
d) Establish after-school routines that require physical activity. Set limits on television and computer use and stick to them.
e) Plan active family vacations and outings to camp, hike, swim, or ski.
f) Advocate for recess at your children's schools. Become an activist for play-based curriculum and outdoor activities.

Eat Healthy!

a) Keep a family journal that describes eating patterns and foods for 2 weeks. Talk about it as a family. Decide together about healthy changes.
b) Make sure everyone in the family eats the same healthy diet (fruits, vegetables, whole grains, skim milk).
c) Schedule meal times together at the dinner table. Expect everyone to come. Eat breakfast every day. Send children to school well-rested.
d) Provide a healthy diet with 30% or fewer calories derived from fat. Skim milk may safely replace whole milk at 2 years of age. Respect children's appetites. Children do not need to finish every bottle or meal!
e) Focus on eating meals without other distractions such as TV, cell phone, and computer use.
f) Do not purchase high-calorie snacks and foods. Remove temptation!
g) Reduce portion sizes. Learn how to visualize and measure healthy portion sizes.
h) Never use food as a reward or punishment. Do not provide food for comfort.
i) Eat fast-food once a week. Take turns choosing the place to eat.

What Can Teachers Do?

Teachers can deliberately plan learning experiences in which all children, including those who are overweight or obese, can succeed or even excel. In addition, all children should have access to responsible adults to whom they can verbalize their feelings and emotional concerns.

Teachers and families must work together to examine their own attitudes and behaviors toward obesity. In a society that stigmatizes obesity, it is easy to instill in young children a sense of self-blame for their overweight condition (Bosch et al., 2001). Self-blame for obesity can lead to a continuous cycle of emotional distress that can lead the child to use food as emotional support, thus exacerbating the problem.

Parents and teachers can model healthful eating habits and encourage adequate levels of physical activity. They must be careful not to single out individual children, especially in front of their peers (Schwartz & Puhl, 2003). By focusing on the adventure

Resources for Teachers, Parents, and Children

Print Materials

Center for Health and Health Care in Schools. (2005). *Childhood obesity: What the research tells us.* www.healthinschoolsl.org

Costante, C. (2002). Healthy learners: The link between health and student achievement. *American School Board Journal, 189*(1).

Pescatore, F. (1998). *Feed your kids well: How to help your child lose weight and get healthy.* New York: Wiley.

Levy, L. (2000). *Understanding obesity.* Queensland, Australia: Firefly Publishers.

Satter, E. (1999). *Secrets of feeding a healthy family.* Madison, WI: Keley Press.

Online Resources

American Academy of Pediatrics (www.pediatrics.org)

American Dietetic Association (www.eatright.org)

American Obesity Association (www.obesity.org/subs/childhood/prevention.shtml)

Centers for Disease Control (www.cdc.gov)

Center for Health and Health Care in Schools (www.healthinschools.org)

Food and Nutrition Information Center, U.S. Department of Agriculture (fnic@nalusda.gov)

International Food Information Council (http://ificinfo.health.org)

International Size Acceptance Association (www.size-acceptance.org/)

Mayo Clinic (www.mayoclinic.com)

National Association of State Boards of Education (www.nasbe.or/HealthySchools/index.html)

Obesity Law and Advocacy Center (www.obesitylaw.com)

Teaching Tolerance (www.splcenter.org/teachingtolerance)

Children's Resources

Cosgove, S., James, R., & Cosgrove, S. (2003). Catundra. E. Rutherford, NJ: Price Stern Sloan.

D'Amico, J., & Drummond. (1994). *The science chef: 100 fun food experiments and recipes for kids.* Hoboken, NJ: Wiley.

Jukes, M. (2003). *Be healthy! It's a girl thing: Food, fitness, and feeling great.* Chicago: Crown.

Rockwell, L. (1999). *Good enough to eat: A kid's guide to food and nutrition.* Peabody, MA: HarperCollins.

Showers, P. (2001). *What happens to a hamburger?* Peabody, MA: HarperCollins.

Silverstein, A. (2000). *Eat your vegetables! Drink your milk!* New York, NY: Scholastic.

Thompson, C., & Stanley, E. (2003). *Overcoming childhood obesity.* Palo Alto, CA: Bull Publishers.

U.S. Department of Agriculture (www.mypyramid.gov/kids)

of enjoying good food and setting expectations for all children in the class, attention is taken off of the child who is overweight. A list of effective preventive and intervention strategies for families and teachers in school and child care settings is presented in Table 2.

What Can Families Do at Home?

Families are children's first teachers and they are the most important role models for children (American Obesity Association, 2005). Survey results reflect the following about parent attitudes and understanding of issues about children who are overweight or obese:

- Most parents (78%) believe that physical education or recess should not be reduced or replaced with academic classes.
- Almost 30% of parents said they were "somewhat" or "very" concerned about their children's weight.
- Almost 30% of parents were concerned about their children's weight but still underestimated or did not understand the long-term health consequences of child overweight and obesity.
- Comparing their own childhood habits to their children's, 27% of parents believe their children eat less nutritiously and 24% state their children are less physically active.
- More than one-third of parents describe their children's school programs for teaching good patterns of eating and physical activity to prevent obesity as "poor," "non-existent," or "don't know."
- A majority of parents, 61%, indicate it would not be difficult for them to change their own eating and/or physical activity patterns if it would help prevent obesity in any of their children (American Obesity Association, 2005, p. 1).

* * *

Global childhood rates of overweight and obesity are increasing dramatically. The causes are complex, and young children who are obese are more likely to become obese adults. Medical outcomes of childhood obesity are serious and include several early-onset conditions.

In order to be effective, childhood obesity intervention strategies must be holistic. Healthful habits and attitudes should be modeled for all children. Children who are unconditionally accepted within school and child care settings are more likely to change eating patterns, increase physical activity, and develop self-awareness strategies that increase their understanding of self and reasons for overeating. Together, early childhood professionals and families can turn the tide toward more healthy behaviors.

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Schwartz, M., & Puhl, R. (2003). Childhood obesity: A societal problem to solve. *Obesity Reviews, 4,* 57-71.

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Put These Ideas Into Practice!

Children, Teachers, and Families Working Together to Prevent Childhood Obesity: Intervention Strategies

by Dolores A. Stegelin

Childhood Obesity Prevention and Intervention Strategies

- Improved nutrition at home, school, and child care
- School wellness plans and improved health policies
- Increased levels of physical activity at home, school, and child care
- Psychological support for children by teachers, families, and administrators: do not tolerate bullying and teasing
- Collaborative planning and intervention among families and teachers
- Outdoor play and increased recess opportunities

Families' Roles

- Model appropriate habits and attitudes toward eating
- Incorporate walking, bicycling, hiking, camping, and other family activities
- Set realistic goals and realize that behavioral changes take time

Teachers' Roles

- Be available for children to verbalize feelings and emotions
- Plan experiences in which all children can succeed
- Examine their own attitudes toward overweight and obesity
- Model healthy eating habits and attitudes
- Advocate for regular outdoor play and recess
- Select inclusive books and materials that include overweight children
- Require that all children participate in physical activity, recess, and health education curriculum

Enrichment experiences for children

- Read books about children who are teased and discuss feelings
- Engage children in making healthy food selections and portion sizes
- Schedule regular play and recess times and encourage peer games and activities that are physically active
- Integrate music, movement, dance, drama, and kinesthetic movement throughout the curriculum and daily routine

Adult learning experiences that build on these ideas

- Involve families in health, physical activity, and curriculum planning
- Seek family input on school food selections
- Invite families to come to the classroom often for exercise, dance, and physical movement

Child-minders and health workers play a crucial role in obesity prevention efforts, but their perceptions of childhood obesity in low- and middle-income countries are poorly understood. This study aims to (1) explore child-minders and health workersâ€™ perceptions of the causes, consequences, potential strategies, and barriers for childhood obesity prevention and intervention in Cape Town, South Africa and (2) to provisionally test the fit of a socioecological framework to explain these perceptions.Â This model for the management of childhood obesity uses a family-based approach.