Obesity in Children

2 CE Hours

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Learning objectives

This workshop is designed to help you:

- Assess obesity statistics that drive current awareness of the obesity problem within the United States;
- Identify causes of obesity in children;
- Describe effects of childhood obesity;
- Calculate body mass index (BMI); and
- Recognize current initiatives and treatment for obesity in children.

Introduction

Health care professionals within the United States and increasingly throughout the world are greatly concerned about the number of seriously overweight and obese children and youth. Recently, experts have confirmed that obesity, diabetes and heart disease, once thought to be afflictions of the affluent, are spreading to the developing world.

Obesity has reached such epidemic proportions that world health officials have decided they need to take a more aggressive approach if they are to change a global explosion of obesity related diseases. After years of focusing on promoting healthy eating to dampen the demand for junk food, the World Health Organization is now examining what can be done on the supply side: enlisting the cooperation of food producers.

Although the presence or development of obesity is a daunting problem, it should not be ignored by mental health professionals. In this course, mental health practitioners will learn:

- What obesity is and why it does not have a DSM diagnosis.
- Causal factors behind obesity.
- Current trends and treatments to address the obesity epidemic within the United States.
- The statistics cited here reflect the impact on the overall health and well-being of youngsters living within the United States.

Juvenile obesity statistics:

- Childhood obesity has more than doubled in children and quadrupled in adolescents in the past 30 years (National Center for Health Statistics, 2011).
- The percentage of children aged 6–11 years in the United States who were obese increased from 5 percent to nearly 21 percent in 2012. Similarly, the percentage of adolescents aged 12–19 years who were obese increased from 5 percent to nearly 21 percent over the same period (National Center for Health Statistics, 2011).
- In 2012, more than one third of children and adolescents were overweight or obese (Ogden, Carroll, Kit, & Flegal, 2014).

Obesity reflects a changed society within the U.S.

Children live in a society that has changed dramatically in the three decades in which the obesity epidemic has developed. Many of these changes will be further explored in this course and include both parents working outside the home, longer work hours by both parents, changes in school food environment, and more meals eaten outside of the home. These changes interface with changes in the physical design of communities that often affect what children eat, where they eat, how much they eat, and the amount of energy they expend in school and leisure time activities.

Other changes, such as the growing diversity of the population, influence cultural views and marketing patterns. Use of computers and video games, along with television viewing, often occupy a large percentage of children’s leisure time and potentially influence levels of physical activity for children as well as for adults. Many of the social and cultural characteristics that the U.S. population has accepted as a normal way of life may collectively contribute to the growing levels of childhood obesity as well.

Obesity – definition

Obesity can be defined as an excessively high amount of body fat in relation to lean body mass. Obesity is a condition where weight gain has gotten to the point that it poses a serious threat to health and when calories consumed exceed the need. It also refers to increased body weight in relation to height, when compared to some standard of acceptable or desirable weight.

Obesity is normally measured in terms of a person’s body mass index or BMI. BMI, therefore, is one important way of deriving desirable weight standards. According to the Centers for Disease Control and Prevention (2013), BMI uses a mathematical formula in which a person’s weight in pounds is divided by the square of the person’s height in inches. This result is then multiplied by 703. BMI is a ratio of weight to height that is calculated by weight in kilograms divided by height in meters squared, is used most commonly to define obesity operationally. BMI is strongly associated with adiposity and obesity-related morbidity, and category thresholds have been established (BMI < 18.5 – underweight; BMI 18.5–24.9 – normal weight; BMI 25–29.9 – overweight; BMI > 30 – obese).

For example, a 13-year-old boy who weighs 190 pounds and is 5 foot 5 inches tall would have a BMI = \([190/(65)(65)]\) x 703 = 31.6.

When infants are born, they have comparatively more fat and this is normal and appropriate. This relatively greater amount of fat provides the infant with some nutritional reserve when they are most vulnerable and adjusting to life outside the womb. The larger amount of fat decreases as the infant grows older.
Around 5 years of age, children have the lowest amount of fat and have the lowest body mass index. If a child between the ages of 2 and 5 is overweight or obese, there is cause for worry.

It is interesting to note that as of 2013, the American Medical Association (AMA) has officially recognized obesity as a disease, joining a number of leading organizations that have previously made this classification, including the National Institutes of Health (1998), the Social Security Administration (1999), the Centers for Medicare and Medicaid Services (2004), The Obesity Society (2008) and the American Association for Clinical Endocrinology (2012).

Children and BMI

- A child’s BMI (body mass index) is calculated using the same method as for adults, but adult BMI figures must not be used to determine whether a child is overweight or obese. Specific age-adjusted charts are needed.
- BMI is used differently for children. Though calculated the same way as for adults, it is then compared to typical values for other children of the same age. Instead of set thresholds for overweight and obesity, then, the BMI percentile allows comparison with children of the same gender and age.
- A BMI that is less than the 5th percentile is considered underweight and above the 95th percentile is considered overweight. Children with a BMI between the 85th and 95th percentile are considered to be at risk of becoming overweight.
- The growth of children is usually documented against a BMI-measured growth chart. Obesity trends can be calculated from the difference between the child’s BMI and the BMI on the chart.
- Clinical professionals should take into consideration the child’s body composition and defer to an appropriate technique such as densiometry since many children who are generally born or grow as an endomorph would be classed as obese.

Obesity is linked to human biology

In the last 20 years, researchers have studied the intricate feedback system in which energy expenditure and food intake are balanced. For example, the brain responds to hormonal signals that maintain body weight by telling us when to start and stop eating, and how much food to consume. Leptin, a hormone produced by fat cells in the stomach, plays a role in suppressing appetite and stimulating energy expenditure.

Other weight regulating hormones include ghrelin, an appetite stimulant; insulin; the orexins; and cholecystokinin. Neurotransmitters such as serotonin, norepinephrine and dopamine are also involved. Over time, even a slight imbalance in hormone regulation can prompt weight gain. For example, leptin levels in most obese humans are high and correlate with body fatness.

In addition, nearly two dozen genes are known to control the production of these weight-regulating hormones, and weight is as inheritable as height. Consequently, obesity becomes a serious problem when the human evolutionary heritage expressed in the body’s control system interacts with modern social conditions because the environment in which bodies evolved were unpredictable when it came to food availability. At that time humans had to store energy beyond immediate need. Therefore, the body’s signals continue to erroneously tell us to eat when we can because there may be no food tomorrow. In addition, humans are especially attracted to sweet, fatty and salty tastes and textures that once indicated scarce essential nutrients.

Research in mice and humans suggests that food high in fat, sugar and calories lowers the body’s response to chronic stress. In animal experiments, weight loss activates the stress responses. When stressed youngsters console themselves with foods high in fat, sugar and calories, they may be inadvertently contributing to lowering their body’s response to stress.

Because obesity is often linked to poor health and subsequent depression and anxiety, research suggests that depressed persons are more likely to develop metabolic syndrome (insulin resistance, high cholesterol, excess abdominal fat, and high blood pressure) that frequently accompanies excess weight, especially if it’s deposited around the waist. And many scientists that investigate food cravings link overeating with addiction.

Brain scans and animal experiments are suggesting that some of the same brain centers are active in both food addiction and drug addiction.

Additional Causal Factors

1. Genetics – Single gene animal models of obesity have led to the identification of several gene products that are associated with obesity. Of particular importance, the mutated gene products in animal models have human homologues that appear to have similar functions, suggesting that these proteins may also play roles in the development or maintenance of human obesity.
   - Genes can directly cause obesity in disorders such as Bardet-Biedl syndrome and Prader-Willi syndrome. However genes do not always predict future health. Genes and behavior both contribute to excess weight. In some cases multiple genes may increase one’s susceptibility for obesity and require outside factors, such as abundant food supply or little physical activity.

2. Behavioral genetics – Behavioral genetics refers to the contribution of genetic variability to relevant behaviors such as eating and physical activity. Consequently behavioral factors such as dietary preference for fats, time between meals, calories eaten versus need, or even inclination to engage in physical activity can have strong genetic components. Therefore, genetically determined preferences may interact with environmental factors to yield conditioned eating patterns. Recognition of certain behaviors may have important implications for targeting behavior change in children.

3. Inherited traits – Inherited traits impact obesity and are an additional genetic effect. Studies have suggested that most of the familial resemblance for body mass index in adults is due to genetic influences rather than shared family environments.

4. Diet – Eating larger portions of higher calorie and energy dense foods significantly contributes to childhood obesity. In addition, many physicians are concerned that children’s bodies were not developed to take in the levels of processed foods they are now eating. And although there are many “foods” in children’s diets that contribute to excessive weight gain, one candidate is carbonated drinks. A single carbonated drink can add 10 percent to a child’s daily energy intake, so reducing solely the amount of soft drinks that a child consumes could cause a significant reduction in obesity risk.
   - Several studies have indicated that in children and adolescents, sugar-sweetened beverage consumption as a percentage of
total caloric intake has increased, while milk consumption has decreased over the last 20 years. The same studies found that sugar-sweetened beverages accounted for 5 percent to 10 percent of caloric intake among children age 2 to 16. In addition, quantities of milk consumed by youngsters decreased by 25 percent and sugar-sweetened beverage consumption increased almost threefold over a 10-year period. Soda consumption, but not the consumption of other beverages, predicted the greatest increase in body mass index.

5. **Toxic environments** – Toxic environments expose children to environmental risk factors that impact weight gain. They include:
   - Sprawling urban areas.
   - Availability and accessibility of convenience foods.
   - Stressful home or school conditions.
   - Larger food packaging.
   - Atmospherics such as lighting, odor and noise.
   - Stockpiled food.
   - Cost of living food options.
   - Food preparation.

6. **Habitual consumption script** – Habitual consumption scripts are formalized when repeated eating that associates certain stimuli with food intake becomes a pattern or script.

7. **Behavior** – Behavior increases a person’s risk for gaining weight. An anxious or depressed child may self-nurture or self-soothe with food for example. This can also be the case if parents are prompted to pacify children with food. Other behaviors include poor eating habits, extended inactivity through television or computer viewing, lack of exercise, and lack of sleep or rest. Socializing during food intake and engaging in other distractions can also contribute to increased food consumption in children.

8. **Culture** – Western culture plays a role in obesity. Adolescent obesity increases among second – and third-generation immigrants to the U.S. as they adopt the American diet and lifestyle. The Western diet typically supplies more than 30 percent of its calories from fat. Sugar is also a problem.

9. **Gender, race, ethnic, and socioeconomic factors** – Between the second and third National Health and Nutrition Examination Surveys (NHANES II and III), the prevalence of overweight conditions and obesity increased in both genders, across all races and ethnicities and across all age groups. Disparities in overweight conditions and obesity prevalence exist in many segments of the population based on race and ethnicity, gender, age and socioeconomic status. Overweight conditions and obesity are particularly common among minority groups and those with a lower family income.
   - In general, women who are members of racial and ethnic minority populations are more likely to be overweight or obese than are non-Hispanic white women. Among men, Mexican Americans are more likely to be overweight and obese than non-Hispanic whites or non-Hispanic blacks. For non-Hispanic men, the prevalence among whites is slightly greater than among blacks.

### The question of metabolic efficiency

Although genetic differences in metabolic efficiency are likely to exist, there is little evidence that low metabolic rate plays a major role in the development or maintenance of obesity for the vast majority of overweight persons, suggesting that the development or maintenance of obesity is mediated by the consumption of a greater than normal amount of food. (APA, 2000)

### Health consequences of childhood obesity

In the past 10 years, there has been a tremendous increase in the number of studies examining the etiology and health effects of obesity in children. It would be no surprise then that physical health, quality of life and psychosocial functioning can be significantly impaired as a result of childhood obesity.

The literature has presented well-documented links between obesity and increased mortality and morbidity due to hypertension, dyslipidemia, diabetes mellitus, coronary heart disease, congestive heart failure, stroke, gallstones, osteoarthritis, sleep apnea, certain types of cancer that include colon, breast, endometrial and gall bladder, menstrual abnormalities, impaired fertility and increased pregnancy risks in overweight people. When children become overweight, they risk early onset of many of these conditions. For example, the risk that an obese 5-year-old child remains obese as an adult is approximately 50 percent. This increases to more than 80 percent for an obese adolescent. On the other hand, the risk of a normal-weight child becoming obese as an adult is only 7 percent.

Excess fat can manifest physically in two ways, each with its own adverse outcomes. An excess amount of fat cells tends to result in respiratory, gastrointestinal and or musculoskeletal problems. Quality of life and other measures of psychosocial functioning may be significantly impaired. Gastroesophageal reflux disease, which can lead to cancer in some cases, is also common, as are skeletal maladies owing to excess weight, particularly in children’s hips and knees.

When fat cells are increased in size, metabolic and inflammatory conditions are often the result, with consequences for the heart, kidneys and liver. One study found that 19-30 percent of these obese children aged 5-11 had elevated blood pressure, with rates higher in boys than in girls, and higher in blacks than in whites. The obese children were also far more likely than normal weight children (11 percent versus 1-2 percent) to be diagnosed with hypertension as the result of three elevated blood pressure readings. Roughly half of obese children were found to have abnormalities of lipid factors.

Endocrine issues such as insulin resistance, impaired glucose tolerance, and Type 2 diabetes are common in obese youth. These cardiovascular and metabolic problems can often result in the condition called metabolic syndrome. (Mentioned previously in this course.) According to researchers, metabolic syndrome may be what underlies much of the morbidity and mortality related to obesity. For example, in normal weight adolescents, it’s virtually nonexistent at 1 percent. In overweight adolescents, it’s about 10 percent, and in obese adolescents, it’s close to 30 percent.

Liver and kidney abnormalities are also quite common in obese youngsters. These conditions can cause damage leading to increased risk of cancers later in life. The evidence is clear that obesity early in life can be devastating to short- and long-term health.

In general, there are six health differences in overweight children, as compared to children with a healthy weight. They include:

- High cholesterol.
- Lipoprotein.
- High blood pressure.
- Blood lipid.
- Insulin levels.

Overall, juvenile obesity can cause:

- Cancer.
- Coronary heart disease.
- Type 2 diabetes.
- High blood pressure.
- Osteoarthritis.
- Hypertension.
- Joint pain.
More about type 2 diabetes

Perhaps one of the most dramatic and disturbing findings in the past decade was the tremendous increase in the incidence of type 2 diabetes in children and adolescents. Previously, it was generally thought that type 2 diabetes was restricted to older age groups and largely did not affect children. However, the increased incidence of type 2 diabetes in the pediatric population was shown by an examination of clinical cases that diagnosed diabetes. For example, in 10-19-year-olds, 33 percent of all cases of diabetes were identified as type 2. This translated to a tenfold increase in the incidence of type 2 diabetes between 1982 and 1994.

More about sleep disorders

Due to an excess amount of fat cells, obstructive sleep apnea is a problem in obese youngsters and occurs in 15-20 percent of obese children, six times the rate of normal weight youngsters.

A research study found that shorter sleep duration is associated with almost a twofold increased risk of being obese. The research suggested that those who sleep less have a greater increase in body mass index and waist circumference over time and a greater chance of becoming obese over time. The “epidemic” of obesity is paralleled by a silent epidemic of reduced sleep duration, with short sleep duration linked to increased risk of obesity both in adults and in children. These trends are detectable in children as young as 5.

Mental health issues

Not long ago, it was commonly believed that overweight and obese people were compulsive eaters, anxious, depressed, under stress, or trying to compensate for emotional deficiencies in their lives. But today, experts are rejecting the theory that weight gain is rooted entirely in emotions. However, the psychological effects of obesity first occur with childhood obesity.

Negative attitudes within Western societies toward obese youngsters are prevalent, not only among the general population, but also with health care providers. These negative attitudes translate into tangible disadvantages in several common areas, including social rejection and discrimination at school, and in the community at large. Consequently, mental health related issues are often present in overweight children. Obese children rated their quality of life with scores as low as those of young cancer patients on chemotherapy.

Other self-reports include:
- Perception of social discrimination.
- Low self-esteem.

- Teasing and bullying at school.
- Difficulties playing sports.
- Fatigue.
- Sleep apnea.

It has been shown that obese adolescents have higher rates of poor self-esteem, and their negative self-image often carries over into adulthood. For example, by the time an obese child is 13 or 14, their self esteem is already significantly less than half that of normal-weight children. Increased rates of depression can occur in children who are overweight due to poor body image, and experience with inhibiting social pressures, such as changing clothes in front of other people.

While obesity is connected to eating disorders recognized by the Diagnostic and Statistical Manual of Mental Disorders (DSM), obesity itself is not considered a mental health disorder and therefore does not appear in the DSM-5. Obesity is included in the International Classification of Diseases (ICD) as a general medical condition but does not appear in the DSM because it has not been established.
that it is consistently associated with a psychological or behavioral syndrome. However, when there is evidence that psychological factors are of importance in the etiology or course of a particular case of obesity, this can be indicated by noting the presence of psychological factors affecting medical condition.

**Binge eating**

There is one potential psychiatric diagnosis that is closely related to obesity. Binge eating disorder is defined as recurring episodes of eating significantly more food in a short period of time than most people would eat under similar circumstances, with episodes marked by feelings of lack of control (APA, 2013). Someone with binge eating disorder may eat too quickly, even when he or she is not hungry. The person may have feelings of guilt, embarrassment, or disgust and may binge eat alone to hide the behavior. This disorder is associated with marked distress and occurs, on average, at least once a week over three months.

Binge eating disorder was approved for inclusion in DSM-5 as its own category of eating disorder. In DSM-IV, binge-eating disorder was not recognized as a disorder but rather described in Appendix B: Criteria Sets and Axes Provided for Further Study and was diagnosable using only the catch-all category of “eating disorder not otherwise specified.”

**Messages to girls versus boys**

Culture and the media send children powerful messages about body weight and shape cultural ideals. While gender has not been identified as a specific risk factor for obesity in children, the pressure upon girls to be thin may put them at greater risk for developing eating disordered behaviors and/or related mood symptoms. Although society presents boys with a wider range of acceptable body images, they are still at risk for developing disordered eating and body image disturbances.

**The impact of culture**

Some Western cultures discriminate against obese individuals. Within the United States it has been documented that obese females have lower acceptance rates for college than non-obese females with the same grades and standardized test scores. The National Longitudinal Survey of Youth study noted that obese adolescent females as young adults had less education, less income, higher poverty rate and decreased rate of marriage as compared to non-obese adolescent females.

**Childhood obesity prevention and intervention**

“Because it is so hard to treat obesity, we’ve tried to focus on preventing obesity from developing children, and we’re trying to do that through a variety of research and educational strategies. If you can prevent kids from becoming overweight and obese at a young age, then you’re much more likely to start to reduce the incidence of obesity in adults. I think there’s the potential that if we can successfully modify our environment to enable people to have a better diet or more physical activity, we can start to see some reductions in the growth of obesity in the next five to 10 years.”

– Dr. Allen Dearry, National Institute of Environmental Health Sciences (NIEHS)

The ultimate goal of childhood obesity prevention and intervention is to assist children to effectively prevent and deal with obesity. This includes assisting children in maintaining energy balance while protecting physical and mental health, growth and development, and nutritional status.

**Treatment guidelines**

Mental health professionals can advocate for early identification and intervention with overweight children as soon as it can be appropriately addressed within the context of a therapeutic setting. Remember that unless a child is severely obese, weight loss is not recommended for the overweight school-age child. Severe caloric restriction could compromise growth, delay the onset of maturity and even enhance emotional overeating. The goal generally is to maintain weight or reduce the rate of gain. If weight is maintained while height increases, the percentage of body fat will decrease without compromising lean body mass and growth.

When addressing a primary physical medical issue such as obesity, make sure that you receive recent medical information or refer your client for a medical examination. In addition to taking a psychosocial history, spend time on reviewing with parents the child’s diet and physical activity habits. The primary goals of obesity therapy should be healthful eating and activity, as well as addressing other causal
factors such as stress, mood disorders, attachment and bonding, and habituated behaviors. As you begin to address obesity issues, assess the readiness of the child and family to engage in discussion about a weight-management program.

Let parents know that they should be cautious about representing a realistic picture of the chances of weight-loss success. Success in terms of weight loss may be limited, but success in terms of enhancing emotional well-being, nutritional status and physical capability may be considerable.

**Behavior modification**

The most effective treatment for obese children and adolescents is behavior and lifestyle modification under the guidance of a physician, weight management specialist or mental health professional experienced in dealing with children and adolescents. Behavior and lifestyle modification involves the following:

- Assessment of child and family eating habits.
- Motivational interviewing.
- Counseling to keep a food/activity diary.
- Extensive family support.
- Joining a weight loss group of peers.
- Limiting the time and place of eating.
- Limiting sedentary activities.
- Recording food intake.

- Recording physical activity.
- Self-monitoring progress.
- Slowing the rate of eating.
- Using rewards and incentives for desirable behaviors.

Motivational interviewing is used to interact effectively with young clients so that a mutually agreed upon set of achievable and incremental goals can be reached in order to support behavior change. Particularly effective are behaviorally based treatments that include problem-solving exercises in a parent-child behavioral program. Children in problem-solving groups, but not those in the behavioral-treatment only groups, significantly reduced percent overweight and maintained reduced weight for six months.

**Parent coaching and family involvement**

Working with obese children involves engagement through parent and family coaching to make step-by-step permanent changes. Education about child and adult obesity as well as teaching nutrition and food preparation are part of coaching parents into wellness. Ongoing support for families after the initial weight-management program will help children maintain.

You can make this information available to clients.

- Tips for healthy eating:
  - Assess your dietary intake.
  - Monitor your portion sizes.
  - Modify food preparation if needed. Reduce the use of fats and sugars.
  - Use the Food Guide Pyramid as a guide for healthful eating.
  - Basing meals and snacks on complex carbohydrates (breads, cereals, rice, pasta, grains).
  - Wait a few minutes before giving additional servings. A break allows time to determine if hunger is the issue.

**Physical activity education**

Physical activity education and discussion is part of addressing childhood obesity with clients. It should be pointed out that overweight children do not experience psychological or physical benefits when they do not engage in regular exercise.

Share these facts with your clients:

- Increased physical activity can decrease or at least slow the increase in fatty tissues in obese youngsters.
- Extended inactivity is not appropriate for normal, healthy children. In addition, inactivity in childhood has been linked to a sedentary adult lifestyle.
- Time, intensity and variety are three important concepts to enhance the impact of physical activity on health, as well as the child’s interest in it.
- Children should take part in at least 60 minutes of age- and developmentally appropriate activities every day. Activity periods should last 10 to 15 minutes or more and include a range of intensities (moderate to vigorous).
- Children should engage in a variety of physical activities of various levels of intensity.
- Physically active parents and siblings serve as role models. They also provide good company for bike rides, walks or swims. Physical activity should be fun and make children feel good, not a chore they must do to lose weight.

Adopting a formal exercise program, or simply becoming more active, is valuable to burn fat, increase energy expenditure, and maintain lost weight. Most studies have shown that exercise will be a successful strategy for weight loss when coupled with another intervention, such as nutrition education or behavior modification. Children’s body weight may not change following 50 minutes of aerobic exercise three times per week, but blood lipid profiles and blood pressure should improve.

**Medical intervention treatment**

Although no drugs are specifically approved for pediatric weight loss, some physicians may prescribe them “off-label.” Because the side effects of these medications in children are unknown, children should not use adult weight loss drugs.

For extremely obese adolescents, surgical procedures called bariatric surgery may be performed, but only rarely. These procedures involve significant surgical alteration of the digestive tract and require substantial modification of diet after the surgery to much less than 1,000 calories per day. Weight loss surgery should only be performed on an adolescent as a last resort.
Alternative treatment

Alternatives for weight loss involve the use of ephedra-containing drugs or herbal preparation or the use of diuretics and laxatives. Both of these practices are unsafe, especially for children and adolescents. Because ephedra can cause severe cardiac side effects, the Food and Drug Administration has issued warnings against its use. Diuretics and laxatives can result in severe dehydration and improper absorption of nutrients.

Other alternative treatments include acupuncture and acupressure that may work to suppress food cravings. Visualization and meditation can create and reinforce a positive self-image that enhances the patient’s determination to lose weight. By improving physical strength, mental concentration and emotional serenity, yoga can provide similar benefits.

Public and private initiatives

Special summer programs and therapeutic schools exist now to address childhood obesity. Much of these summer camp programs focus on healthy eating and exercise habits.

In addition, in early 2004, the first alternative school for overweight and obese children, which operates like other private and charter schools but with a focus on healthy weight loss and maintenance, was established.

The Centers for Disease Control have recommended that schools establish policies that promote enjoyable, lifelong physical activity among young people. Their guidelines state, “Physical education should emphasize skills for lifetime physical activities, rather than those for competitive sports.” These experts also recommend that fitness-enhancing physical activities become an integral part of the American family’s lifestyle.

Many states are publicly and privately collaborating to focus on physical activity and healthy eating in order to address health risks in children and youth. Stakeholder groups, including businesses, schools, health care, faith-based groups and community organizations contribute to efforts within current and developing programs.

Other community programs focus on time-based programs that address exercise, education, self-esteem, interactive workouts and evolving media attention.

National public policy is evaluating science-based and best-practice protocols to address childhood obesity issues. Federally funded conferences are now held to continue to address this problem.

In addition, large private companies such as PepsiCo have recognized that there is tremendous business opportunity in offering consumers more nutritious, healthful products.

Key terms:

- Adipose tissue – Fat tissue.
- Ghrelin – A peptide hormone secreted by cells in the lining of the stomach important in appetite regulation and maintaining the body’s energy balance.
- Hyperlipidemia – A condition characterized by abnormally high levels of lipids in blood plasma.
- Hyperplastic obesity – Excessive weight gain in childhood characterized by an increase in the number of new fat cells.
- Hypertension – Abnormally high arterial blood pressure, which if left untreated can lead to heart disease and stroke.
- Hypertrophic obesity – Excessive weight gain in adulthood, characterized by expansion of already existing fat cells.
- Ideal weight – Weight corresponding to the lowest death rate for individuals of a specific height, gender and age.
- Leptin – A protein hormone that affects feeding behavior and hunger in humans.

Conclusion

Childhood obesity affects over 9 million children, making it the most common chronic disease of childhood. Today, more and more children are being diagnosed with diabetes, hypertension and other co-morbid conditions associated with obesity and morbid obesity.

A child is defined as “overweight” if their weight-to-age percentile is greater than 95 percent. A child is defined as “at risk for overweight” if their weight-to-age percentile is greater than 85 percent and less than 95 percent.

Our biology and environment play major roles in shaping habits and perceptions in children. In addition, children are encompassed by environmental influences that demote the importance of physical activity, such as processed foods and urban sprawl. All of these factors contribute to sedentary lifestyles and ultimately to childhood obesity.

Childhood obesity is now being addressed, both nationally and locally through a variety of initiatives and programs. Research on obesity is uncovering new links between the environment and our genes, and interventions are being studied to identify best-practice protocols.

Bibliography

1. Obesity can be defined as an excessively high amount of body fat in relation to _________.
   a. Height.
   b. Lean body mass.
   c. Amount of exercise.
   d. Daily caloric intake.

2. The passage of a new American Medical Association policy classifying obesity as a ________ reinforces the science behind obesity prevention and treatment.
   a. Mental health disorder.
   b. Scientific study.
   c. Disease.
   d. Proven theory.

3. A BMI that is less than the 5th percentile is considered underweight and above the _____ percentile is considered overweight.
   a. 80th.
   b. 85th.
   c. 90th.
   d. 95th.

4. ______, a hormone produced by fat cells in the stomach, plays a role in suppressing appetite and stimulating energy expenditure.
   a. Leptin.
   b. Serotonin.
   c. Ephedrine.
   d. Adrenaline.

5. Because obesity is often linked to poor health and subsequent depression and anxiety, research suggests that depressed persons are more likely to develop _______.
   a. Fisher syndrome.
   b. Pica syndrome.
   c. Metabolic syndrome.
   d. Serotonin syndrome.

6. ______ are formalized when repeated eating that associates certain stimuli with food intake becomes a pattern or script.
   a. Cultural norms.
   b. Habitual consumption scripts.
   c. Addiction scripts.
   d. Behavioral standards.

7. Although ______ differences in metabolic efficiency are likely to exist, there is little evidence that low metabolic rate plays a major role in the development or maintenance of obesity.
   a. Gender.
   b. Genetic.
   c. Scientific.
   d. Strategic.

8. Endocrine issues such as ______ resistance, impaired glucose tolerance, and Type 2 diabetes are common in obese youth.
   a. Insulin.
   b. Neuron.
   c. Amoxicillin.
   d. Toxin.

9. Perhaps one of the most dramatic and disturbing findings in the past decade was the tremendous increase in the incidence of ________ in children and adolescents.
   a. Anxiety.
   b. Binge eating.
   c. Type 2 diabetes.
   d. Depression.

10. Due to an excess amount of fat cells, ________ is a problem in obese youngsters and occurs in 15-20 percent of obese children, six times the rate of normal weight youngsters.
    a. Liver disease.
    b. Obstructive sleep apnea.
    c. Type 1 diabetes.
    d. Asthma.

11. While obesity is included in the ______________ as a general medical condition, it is not considered a mental health disorder and therefore does not appear in the DSM-5.
    c. National Medical Index.
    d. Medical Condition Guidebook.

12. ________ is defined as recurring episodes of eating significantly more food in a short period of time than most people would eat under similar circumstances, with episodes marked by feelings of lack of control.
    a. Bulimia nervosa.
    b. Anorexia nervosa.
    c. Binge eating disorder.
    d. Anxiety feeding disorder.

13. Research priorities should include evaluation of ________, behavioral research on how to change dietary and physical activity habits, a community-based approach and best-practice protocols that address the mental health needs of overweight and obese youngsters.
    a. Interventions.
    b. Educational exposure.
    c. Access to food.
    d. Parental involvement.

14. Severe caloric restriction could ________, delay the onset of maturity and even enhance emotional overeating.
    a. Reduce energy.
    b. Cause insomnia.
    c. Induce shock.
    d. Compromise growth.

15. ____________ is used to interact effectively with young clients so that a mutually agreed upon set of achievable and incremental goals can be reached in order to support behavior change.
    a. Action planning.
    b. Motivational interviewing.
    c. Group therapy.
    d. Family intervention.