Textbook: *Obesity and Weight Management*

The Problem

Obesity is one of the most challenging health issues that the United States has ever faced. Two-thirds of adults and nearly one-third of children and teens are currently either obese or overweight, putting them at increased risk for more than 20 major diseases, including type 2 diabetes and heart disease. It’s not just our health that is suffering: obesity-related medical costs and a less productive workforce are hampering America’s ability to compete in the global economy. (Robert Wood Johnson Foundation) Full-time workers in the U.S. who are overweight or obese and have other chronic health conditions miss an estimated 450 million additional days of work each year compared with healthy workers, resulting in an estimated cost of more than $153 billion in lost productivity annually. (Gallup)

However, obesity is not exclusive to the United States. Globally, the World Health Organization (WHO) expects the number of overweight individuals to double by the year 2015.

Know the Terms:

1. **Anorexia Nervosa**: Eating disorder characterized by excessive food restriction, irrational fear of weight gain, and a distorted image of one’s body.
2. **Basal Metabolic Rate (BMR)**: Calorie expenditure by a body at complete rest.
3. **Binge-Eating Disorder (BED)**: An eating disorder characterized by compulsive overeating, consuming large amounts of food while feeling out of control and/or powerless to stop.
4. **Body Image**: The way you see yourself; your mental picture of how you look.
5. **Body Mass Index (BMI)**: Calculated version of Height/Weight Scale.
6. **Bulimia Nervosa**: Eating disorder characterized by binge eating followed by purging (vomiting), to prevent weight gain.
7. **Eating Disorder**: Disorder/illness characterized by a disturbance in body image and eating patterns.
8. **Eating Disorder Not Otherwise Specified (EDNOS)**: Diagnosed eating disorder that does not fit the diagnostic criteria for any specific eating disorder.
9. **Exercise Metabolic Rate (EMR)**: Calories burned during exercise.
10. **Morbidly Obese**: 100 lbs. over ideal body weight, or a Body Mass Index (BMI) of over 40, or accumulated body fat that causes adverse health effects.
11. **Obesity**: Excessive body fat; BMI of 30 or higher.
12. **Overweight**: BMI of 25-29
13. **Resting Metabolic Rate (RMR)**: Calories burned during BMR conditions, plus minimal daily sedentary activities.
14. **Satiety**: A satisfied feeling of fullness after a meal.
15. **Underweight**: Generally considered as body weight more than 10% below recommended levels; BMI below 18.5.
16. **Visceral Fat**: Referred to as belly fat, omental fat, or intra-abdominal fat; fat located deep within the abdomen surrounding internal organs; associated with various metabolic disorders.
17. **Waist-To-Hip Ratio**: Assessment of fat distribution or location; waist circumference divided by hip circumference.
18. **Yo-Yo Dieting**: Also referred to as weight cycling; cycles of diet induced weight loss followed by regaining weight.
Weight Control: Basic Training

1. Overweight and Obesity:
   - **Defined:**
     - Overweight and obesity are both labels for ranges of weight that are greater than what is generally considered healthy for a given height. The terms also identify ranges of weight that have been shown to increase the likelihood of certain diseases and other health problems.
       - **Overweight:** An adult who has a BMI between 25 and 29.9
       - **Obesity:** Excessive amount of body fat in relation to lean body mass; an adult who has a BMI of 30 or higher
     - The World Health Organization defines both overweight and obesity as abnormal or excessive fat accumulation that may impair health.

2. About Fat:
   - **Types of Fat:**
     - **Essential Fat:**
       - Fat in the marrow of bones, in the heart, lungs, liver, spleen, kidneys, intestines, muscles, and lipid-rich tissues throughout the central nervous system
       - Necessary to maintain life and reproductive functions
       - Percentage of essential body fat for women is greater than that for men, due to the demands of childbearing and other hormonal functions
       - The percentage of essential fat is 3%–5% in men, and 8–12% in women
     - **Storage Fat:**
       - Fat located directly beneath the skin (subcutaneous storage fat) and around internal organs (internal storage fat, or visceral fat)
       - Unused calories converted to storage fat
   - **Location of Fat:**
     - Research shows that people with "apple-shaped" bodies (with more weight around the waist) face more health risks than those with "pear-shaped" bodies who carry more weight around the hips.
     - Upper abdominal (visceral) fat, referred to as omental fat or toxic fat is closely linked with a number of chronic disease risks.
       - Studies show the leading causes of visceral fat to be high sugar/fat (including fructose and alcohol) consumption, unmanaged stress, and inactivity or non-exercise.
     - February 2012 issue of The Journal of Nutrition reports that fructose (high-fructose corn syrup) consumption may increase cardiovascular risk factors by increasing visceral fat (click here)

3. Causes of Obesity:
   - **Energy Balance:**
     - Managing body weight is a balancing act (Calories In versus Calories Out).
     - Maintaining Weight: Calories in (eaten) are the same as the calories out (burned).
     - Gaining Weight (positive calorie balance): More calories in, less calories out.
     - Weight Loss (negative calorie balance): Less calories in, more calories out.
     - 3,500 calories equals about 1 pound (0.45 kilogram) of fat.
       - **Example:** You need to burn 3,500 calories more than you take in to lose 1 pound; thus, if you cut 500 calories from your typical diet each day, or, increased 500 calories burned through exercise daily, you would lose about 1 pound a week (500 calories x 7 days = 3,500 calories).
   - **Behavioral Factors:**
     - High consumption of calorie dense food and drink (calories in)
       - Because of government subsidies, nutrient-deficient, calorie-dense (high calorie) foods have become very inexpensive.
       - Americans are "eating out" more today
       - Americans are eating more "processed-packaged" foods (sources of high calories or calorie-dense foods)
• Portion sizes have increased exponentially during the past several decades (see Click for Portion Control below)
• Sugar consumption has increased in past several decades (especially product hidden sugars)
• Physical fitness levels of most Americans have decreased.
• Technology has increased the sedentary lifestyle for both children and adults
  • Work, schoolwork, and leisure activity time is spent in front of TVs, computers, and smart phones
• Emphasis on K-12 and college-university Fitness/Health programs have decreased dramatically.

Environmental Factors:

• Our environment does not support healthy lifestyle habits; in fact, it encourages obesity. Some reasons include:
  • Lack of neighborhood sidewalks and safe places for recreation. Not having area parks, trails, sidewalks, and affordable gyms makes it hard for people to be physically active.
  • Work schedules. People often say that they don't have time to be physically active because of long work hours and time spent commuting.
  • Lack of access to healthy foods. Some people don't live in neighborhoods that have supermarkets that sell healthy foods, such as fresh fruits and vegetables. Or, for some people, these healthy foods are too costly.
  • Food advertising. Americans are surrounded by ads from food companies. Often children are the targets of advertising for high-calorie, high-fat snacks and sugary drinks. The goal of these ads is to sway people to buy these high-calorie foods, and often they do.

Unmanaged Stress:

• Studies have discovered that the stress hormone cortisol directly impacts fat cells by unlocking certain receptors in these cells, allowing them to grow bigger than normal and also to multiply.
• Studies also show that chronic stress leads to "self-destructive" habits such as reaching for the alcohol or junk food (comfort food).

Genetics and Family History:

• Studies of identical twins who have been raised apart show that genes have a strong influence on a person's weight. Overweight and obesity tend to run in families. Your chances of being overweight are greater if one or both of your parents are overweight or obese.
  • Genes set metabolic rates, influencing how the body handles calories.
  • A variation in the GAD2 gene increases the production of a chemical that boosts appetite and signals us to eat.
  • The Ob gene (for obesity) is believed to disrupt the body's signal system that a person has had enough to eat (satiety) and may prompt individuals to keep eating past the point of feeling comfortably full.
  • Your genes also may affect the amount of fat you store in your body and where on your body you carry the extra fat.
• Because families also share food and physical activity habits, a link exists between genes and the environment.
• Children adopt the habits of their parents. A child who has overweight parents who eat high-calorie foods and are inactive will likely become overweight too. However, if the family adopts healthy food and physical activity habits, the child's chance of being overweight or obese is reduced.

Health Conditions:

• Some hormone problems may cause overweight and obesity, such as underactive thyroid (hypothyroidism), Cushing's syndrome, and polycystic ovarian syndrome (PCOS).
▪ Underactive thyroid is a condition in which the thyroid gland doesn't make enough thyroid hormone. Lack of thyroid hormone will slow down your metabolism and cause weight gain. You'll also feel tired and weak.
▪ Cushing's syndrome is a condition in which the body's adrenal glands make too much of the hormone cortisol. Cushing's syndrome also can develop if a person takes high doses of certain medicines, such as prednisone, for long periods.
▪ People who have Cushing's syndrome gain weight, have upper-body obesity, a rounded face, fat around the neck, and thin arms and legs.
▪ PCOS is a condition that affects about 5–10 percent of women of childbearing age. Women who have PCOS often are obese, have excess hair growth, and have reproductive problems and other health issues due to high levels of hormones called androgens.

▪ **Medications:**
  ▪ Certain medicines may cause you to gain weight. These medicines include some corticosteroids, antidepressants, and seizure medicines.
    ▪ These medicines can slow the rate at which your body burns calories, increase your appetite, or cause your body to hold on to extra water. All of these factors can lead to weight gain.

4. **Obesity and Chronic Disease:**
   o *Obesity increases the risk of many health conditions, including the following:*
     ▪ Coronary heart disease, stroke, and high blood pressure (obesity increases vascular inflammation).
     ▪ Type 2 diabetes.
     ▪ Cancers, such as endometrial, breast, and colon cancer.
     ▪ High total cholesterol or high levels of triglycerides.
     ▪ Liver and gallbladder disease.
     ▪ Sleep apnea and respiratory problems.
     ▪ Degeneration of cartilage and underlying bone within a joint (osteoarthritis).
     ▪ Reproductive health complications such as infertility.
     ▪ Mental health conditions.

5. **Body Image and Eating Disorders:**
   o Eating disorders are real, complex, and devastating conditions that can have serious consequences for health, productivity, and relationships.
   o They are not a fad, phase or lifestyle choice. Eating disorders are serious, potentially life-threatening conditions that affect a person’s emotional and physical health.
   o People struggling with an eating disorder need to seek professional help. The earlier a person with an eating disorder seeks treatment, the greater the likelihood of physical and emotional recovery.
   o In the United States, nearly 10 million females and 1 million males are fighting a life and death battle with an eating disorder such as anorexia or bulimia. Millions more are struggling with binge eating disorder.
   o For various reasons, many cases are likely not to be reported.
   o In addition, many individuals struggle with body dissatisfaction and sub-clinical disordered eating attitudes and behaviors. More than 80% of women are reported to be dissatisfied with their appearance *(Smolak, 1996)*
   o **Types of Eating Disorders:**
     ▪ **Anorexia Nervosa:**
       ▪ Characterized by an intense fear of gaining weight, self-starvation, loss of menstrual periods, body dissatisfaction and significant disturbance in perception of shape or size of his or her body, and a body weight that is 15% below normal.
       ▪ **Signs and Symptoms:**
         ▪ Intense fear of gaining weight
         ▪ Belief that they are fat although they are actually extremely thin
         ▪ Restriction of calories
         ▪ Avoids social situations where s/he may have to eat in front of others
         ▪ Unusual eating habits or rituals
         ▪ Obsessive or compulsive exercise
- Hyperactivity or fatigue
- Isolation from friends and family

**Bulimia Nervosa:**
- Characterized by bingeing (consuming large amounts of food at one sitting while feeling out of control), purging (getting rid of food by using laxatives, vomiting, obsessive exercise, dissatisfaction with body, and fear of gaining weight).
- Signs and Symptoms:
  - Fear of being fat
  - Eats in secret
  - Goes to the bathroom immediately following meals
  - Hoards food
  - Mood swings
  - Abuse of alcohol or other substances
  - Over-exercising
  - Isolation from friends and family

**Binge Eating Disorder:**
- Characterized by recurrent episodes of binge eating without the purging behavior of bulimia.
- Signs and Symptoms:
  - Eating alone and in secret
  - Feelings of guilt, shame and disgust about overeating
  - Eating large amounts of food when not hungry
  - Abuse of alcohol or other substances

**Eating Disorder Not Otherwise Specified (NOS):**
- Includes people who have characteristics of one or more eating disorder but who do not fit the diagnostic criteria for any one disorder.
- Someone with an Eating Disorder NOS may exhibit some combination of the above symptoms.

**Treatment of Eating Disorders**
- Eating disorders are most successfully treated when diagnosed early.
- A complete physical examination is necessary to determine if there is immediate medical danger and to rule out other illnesses.
- Hospitalization may be required.
- Treatment often involves a combination of interventions including:
  - Individual, group or family psychotherapy
  - Cognitive therapy
  - Behavioral therapy
  - Nutritional counseling
  - Antidepressant medication
- Support groups may be helpful for some individuals and are often offered through hospitals as well as by national eating disorder advocacy organizations. Recovery is a long process and relapse is not uncommon. Support and treatment are needed to help the individual continue his/her recovery, even if s/he suffers a relapse.

**Talk’n Stats:**

Statistics from the Robert Wood Johnson Foundation, "F AS IN FAT 2011 MAJOR FINDINGS"

- Washington state ranks 28th in obesity rates among states in the US (26.4% of population is obese)
  - Up from 10.1% in 1990
- Adult obesity rates rose in 16 states over the past year. No state decreased.
- Twelve states now have obesity rates above 30 percent: Alabama, Arkansas, Kentucky, Louisiana, Michigan, Mississippi, Missouri, Oklahoma, South Carolina, Tennessee, Texas, and West Virginia.
  - Four years ago, only one state was above 30 percent.
- Obesity rates exceed 25 percent in more than two-thirds of states (38 states).
• Obesity rates rose for a second year in a row in six states (Illinois, Kentucky, Massachusetts, Missouri, Rhode Island, and Texas) and rose for a third year in a row in five states (Florida, Kansas, Maine, Oklahoma, and Vermont).
  o Mississippi had the highest rate of obesity at 34.4 percent. Colorado had the lowest rate at 19.8 percent and is the only state with a rate below 20 percent.

• Obesity and obesity-related diseases such as diabetes and hypertension continue to remain the highest in the South. Except for Michigan, the top 10 most obese states in the country are all in the South. In addition, nine of the 10 states with the highest rates of diabetes and physical inactivity are in the South, as are the 10 states with the highest rates of hypertension. Northeastern and Western states continue to have the lowest obesity rates.

• Adult diabetes rates increased in 11 states and Washington, D.C. in the past year. In eight states, more than 10 percent of adults now have type 2 diabetes.

• The number of adults who report they do not engage in any physical activity rose in 14 states in the past year. Two states (California and Texas) saw a decline in adult physical inactivity levels.

• Obesity increased for men in nine states, and for women in ten states, and decreased for women in one state (Nevada).

• Those who did not graduate high school have the highest rates of obesity (32.8 percent).
  o Those who graduated high school but did not go on to college or a technical school have the second highest obesity rate (30.4 percent)
  o Those who went to college/technical school had an obesity rate of 29.6 percent.
  o Those who graduated from college/technical school had the lowest obesity rate (21.5 percent).

• Households that make less than $15,000 have a 33.8 percent obesity rate. They are followed closely by households that make between $15,000 and $25,000 (31.8 percent), $25,000 and $35,000 (29.7 percent) and $35,000 and $50,000 (29.5 percent). However, households that have an income above $50,000 have a 24.6 percent obesity rate.

Know Your Numbers:

Assessing or Measuring Levels of Fat:

• **Body Mass Index (BMI):**
  o BMI is a number calculated from a person's weight and height; a calculated version of the traditional Height-Weight Scales
    ▪ Higher BMI values indicate greater weight per unit of height
  o It is used to identify people at risk for certain health problems, and is related to the risk of disease and death
  o BMI has several significant limitations:
    ▪ It may overestimate body fat in athletes and others who have a muscular build
    ▪ It may underestimate body fat in older persons and others who have lost muscle mass
  o For additional BMI information, click on the image to the right.

• **Body Composition:** (Contact the On-Campus Fitness Professional for a Body Composition Test)
  o Body Composition is defined as a comparison of fat versus lean tissue in the body; expressed as a percentage or ratio of lean mass to fat mass
  o Types of Assessments:
    ▪ **Hydrostatic (Underwater) Weighing:**
      ▪ A comparison of total body weight to body weight while submerged in water
    ▪ **Skinfold Calipers:**
      ▪ Measuring the pinched or folded fat (subcutaneous fat) thickness at least three specific sites of the body
      ▪ Most equations use the sum of at least three skinfolds to estimate body density from which body fat may be calculated
    ▪ **Bioelectrical Impedance:**
      ▪ Standing on, or hold a device emitting an undetectably low voltage electric current
      ▪ Fat is a poor conductor of electricity, thus will impede the current more than lean tissue
- By measuring the resistance to the current, the machine estimates the percent body fat.

- Measuring Tape:
  - Measure at your belly button
  - Pull the tape so it is snug, but not compressing the skin.
  - Keep the tape level.
  - Waist size should be less than half your height.

Thoughts for Living:

What I Can Do for Me to Combat Obesity:

- **Understand that Weight Control is a "Lifestyle", not a Diet**
  - Evidence shows that people who lose weight gradually (about 1 to 2 pounds per week) are more successful at keeping weight off.
  - The goal is to impact basal metabolic rate.
  - Studies show that almost 75% of those who try weight loss dieting alone will regain the weight within two years or less.

- **Make your Goals and make your Commitment** (See "Thoughts on Changing a Health Behavior" in Lesson 1)

- **Consider Seeing your Healthcare Provider**
  - For advice and baseline numbers (such as blood pressure, cholesterol, weight, body composition, etc)
  - You can also see your school Fitness Professional for blood pressure, weight, and body composition testing.

- **Identify Sources of Support**
  - Family member, Friends, Classmates, Weight Loss Groups

- **Learn about Nutrition**
  - Do your homework concerning food, supplements, food labels, smart shopping, processed foods, in season fruits and veggies, healthy cooking, etc.

- **Change your Eating Habits:**
  - Create an attractive and comfortable area designated only for eating,
    - Turn off the television, drop the newspaper, shut down the cell phone and computer.
    - For the next 15 minutes, your only task at hand is to enjoy your meal.
  - Focus on your meal and each bite, try to resist the urge to swallow until the entire bite is completely chewed.
  - Pay attention to satiety, when you reach the point of feeling satisfied, make a conscious choice to stop eating, even if food remains on your plate.

- **Pay attention to Common Over-Eating Cues:**
  - Opening up the cabinet and seeing your favorite snack food.
  - Sitting at home watching television.
  - Before or after a stressful meeting or situation at work.
  - Coming home after work and having no idea what's for dinner.
  - Walking past a candy dish on the counter.
  - Sitting in the break room beside the vending machine.
  - Seeing a plate of doughnuts at the morning staff meeting.
  - Swinging through your favorite drive-through every morning.
  - Feeling bored or tired and thinking food might offer a pick-me-up or give me something to do with my time.

- **Schedule Activity and Movement Daily:**
  - See your school's Fitness Professional or Instructor for a prescription fitness program specifically for you.
  - Build it into your daily routine and schedule
  - Focus on less mechanical assistance and more movement in all daily activities.
What I Can Do for My Family to Combat Obesity:

- **Look for ways to make favorite dishes healthier.**
  - The recipes that you may prepare regularly, and that your family enjoys, with just a few changes can be healthier and just as satisfying.

- **Remove calorie-rich temptations!**
  - Although everything can be enjoyed in moderation, reducing the calorie-rich temptations of high-fat and high-sugar, or salty snacks can also help your children develop healthy eating habits.
  - Instead only allow your children to eat them sometimes, so that they truly will be treats!
  - Examples of "quick-grab" items to have available include apples, bananas, blueberries, grapes, carrots, whole grain crackers, hummus, etc.

- **Help kids stay active.**
  - Remember that "Association breeds Assimilation". Be a "physically active" example for your children.
  - Start adding physical activity to your own daily routine and encourage your child to join you.
    - Examples of moderate intensity physical activity include brisk walking, playing tag, jumping rope, playing soccer, swimming, dancing, etc.
  - Children and teens should participate in at least 60 minutes of moderate intensity physical activity most days of the week, preferably daily.

- **Reduce sedentary time.**
  - In addition to encouraging physical activity, help children avoid too much sedentary time.
  - Although quiet time for reading and homework is fine, limit the time your children watch television, play video games, or surf the web to no more than 2 hours per day.
  - Additionally, the American Academy of Pediatrics (AAP) does not recommend television viewing for children age 2 or younger.
  - Instead, encourage your children to find fun activities to do with family members or on their own that simply involve more activity.