Body Composition & Nutrition


Lesson Goal & Objectives

Lesson Goals: To summarize the various aspects of overweight and obesity, and show how they are affected by physical activity.

Lesson Objectives: Following the completion of this lecture the student will be able to discuss the:

- terms overweight, obesity, and their assessment.
- prevalence of obesity in the United States.
- health implications of obesity.
- control of body weight & the etiology of obesity.
- role of physical activity in weight reduction.
- food guide pyramid.
- consequences of an unhealthy diet.

Overweight & Obesity Defined

- **Overweight**
  - “Body weight that exceeds the normal or standard weight for a particular person, based on his or her height and frame size.”
  - Measured with height/weight tables.
  - Over the 85th percentile

- **Obesity**
  - “Condition in which the individual has an excessive amount of body fat”
    - Males over 25% & women over 35% body fat are obese
    - Males 20-25% & women 30-35% body fat are considered to have borderline obesity
  - Over the 95th percentile
  - Variety of laboratory & field assessment techniques used to measure a person’s body composition:
    - Hydrostatic weighing
    - Bioelectrical impedance
    - Ultrasound
    - Skinfold

Body Composition Values

<table>
<thead>
<tr>
<th></th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>17%</td>
<td>10%</td>
</tr>
<tr>
<td>Ideal</td>
<td>18-23%</td>
<td>16-19%</td>
</tr>
<tr>
<td>Maximum</td>
<td>32%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Interesting links:
http://www.am-i-fat.com/body_fat_percentage.html
http://www.am-i-fat.com/body_mass_index.html
http://team.liu.edu/~Lopos/fp/bodyc.htm
http://www.christie.ab.ca/aadac/WhoAmI/perfectbody.htm

Body Types

- **Endomorph**
  - a large, soft, bulging and pear-shaped appearance
  - high percentage of body fat
  - short neck
  - large abdomen
  - wide hips
  - round, full buttocks
  - short, heavy legs

- **Mesomorph**
  - a solid, muscular, and large-boned physique
  - firm, well-developed muscles
  - large bones
  - broad shoulders
  - muscular arms & buttocks
  - trim waist
  - powerful legs

- **Ectomorph**
  - a slender body and slight build
  - small bones
  - thin muscles
  - slender arms & legs
  - narrow chest
  - round shoulders
  - flat abdomen
  - small buttocks

Prevalence of Obesity in the U.S.

- **Dramatically increasing trend** in the prevalence of obesity over the past 30 years in the U.S.

  - National Center for Health (1986):
    - 28.4% of American adults aged 25-74 years are overweight.
    - Between 13% and 26% of U.S. adolescent population are obese with an addition 4% to 12% being super-obese, depending on gender and race.
    - These figures represent a 39% increase in the prevalence of obesity when compared with data collected in 1966 and 1970.

  - Gortmaker, Dietz, Sobol, & Wehler (1987):
    - Reported 54% increase in prevalence of obesity among children aged 6 to 11 years.
Health Implications of Obesity

- **Medical Risks**
  - Increased risk for *general excess mortality*. Possible causes include heart disease, hypertension, & diabetes.
  - Upper body obesity ("apple-shaped") involves increased risk of cardiovascular disease, hypertension, stroke, elevated blood lipids, and diabetes.
  - "Pear-shaped" individuals have excess weight on the hips and thighs (less cardiovascular risk).

- **Low Physical Fitness Levels**

- **Psychosocial Effects**

Physiological Considerations

- **The Control of Body Weight**
  - Balance between caloric intake & expenditure.

- **Etiology of Obesity**
  - Complex and multi-factored:
    - Genetic influences
    - Hormonal imbalances
    - Alterations in homeostatic function
    - Physiological & psychological trauma
    - Emotional trauma
    - Environmental factors
      - Cultural habits
      - Inadequate physical activity
      - Improper diet

Weight Reduction and Control

- **Behavior Modification**
  - Dietary intake
  - Physical activity

- **Body Composition Myths**
  - Fad diets
  - Spot reduction
  - Low intensity versus high intensity aerobic exercise
  - Exercise devices for fat reduction

Diet and Nutrition

- **Diet**: Total calories consumed in 5-7 day period

- **“Good” nutrition**
  - Variety of foods
  - Provides adequate nutrients
  - Supplies sufficient energy to maintain ideal body mass

- **Agencies developing guidelines:**
  - Committee on Dietary Allowances: RDAs
  - Food and Drug Administration
  - USDA: Food Guide Pyramid

- **Adolescent nutritional needs** (Saltman, Gurin & Mothner, 1993):
  - Females: 2,200 cal/day
  - Males: 3,000 cal/day

Consequences of an Unhealthy Diet

- Increased calories consumed by eating "low cal" foods

- High protein/low carbohydrate diets suppress appetite; can be toxic over time

- High carbohydrate diets can compromise energy intake and provide too little protein

- Over-consumption of vitamins/minerals only generates expensive urine

- Good diet NOR physical activity alone can = fitness