Nutrition in Health course

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Module 4: Overweight and obesity

- **Prevalence of overweight and obesity.**
- **Causes of overweight and obesity.**
- **Common health consequences of obesity.**
- **Diagnosis of overweight and obesity.**
- **Management and prevention of overweight and obesity.**

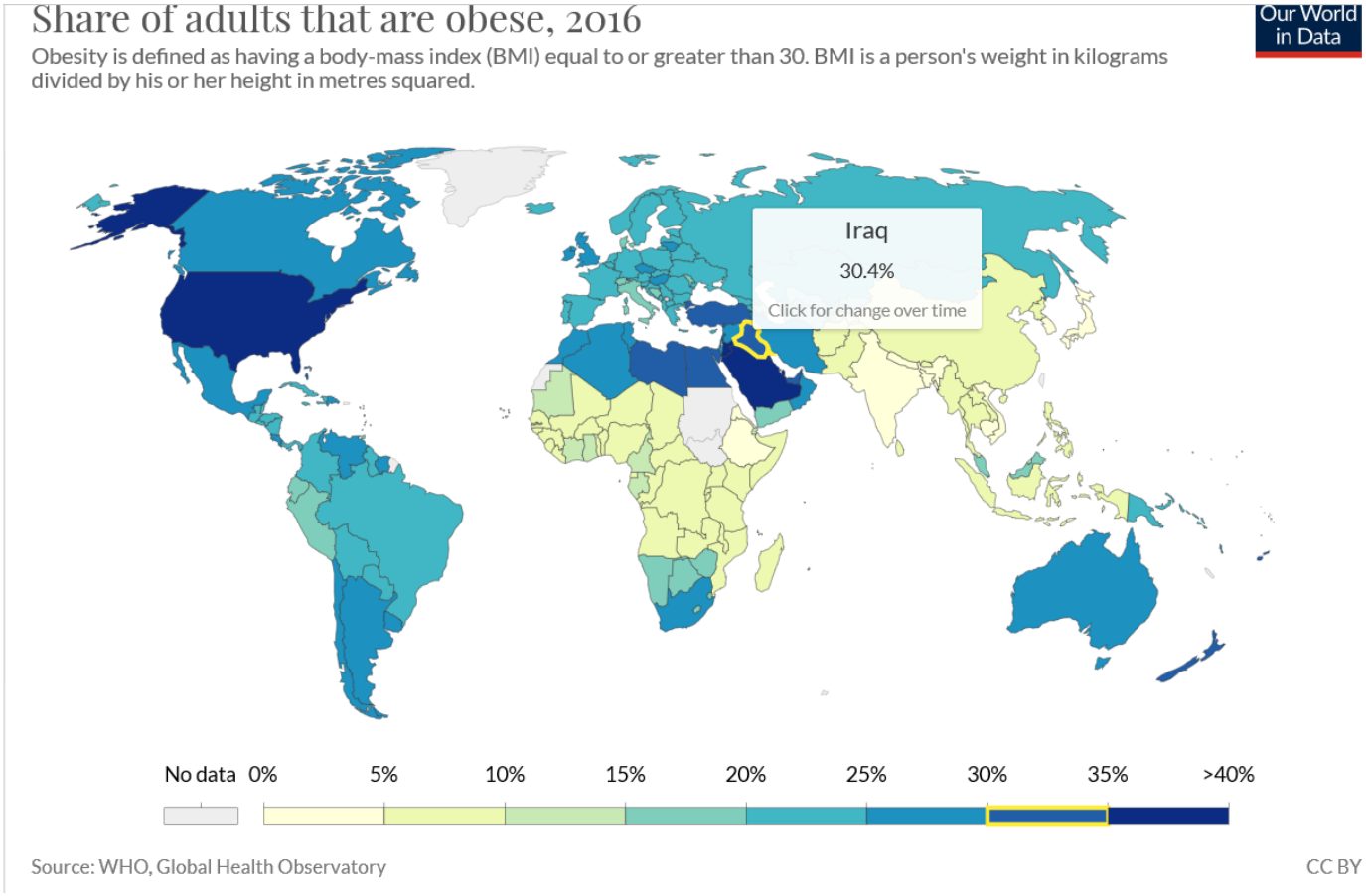
Prevalence:

- In 2022, 1 in 8 people in the world were living with obesity.
- Worldwide adult obesity has more than doubled since 1990, and adolescent obesity has quadrupled.
- In 2022, 2.5 billion adults (18 years and older) were overweight. Of these, 890 million were living with obesity.
- In 2022, 43% of adults aged 18 years and over were overweight and 16% were living with obesity.
- In 2022, 37 million children under the age of 5 were overweight.
- Over 390 million children and adolescents aged 5–19 years were overweight in 2022, including 160 million who were living with obesity.

Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. In 2019, an estimated 5 million noncommunicable disease (NCD) deaths were caused by higher-than-optimal BMI. More than half (55%) of all mortality in Iraq in 2016 was attributable to non-communicable diseases (NCDs).

In several local surveys in subregions and clinical populations in Iraq, high proportions of obesity have been reported. For example, in a community-based survey (N = 1480 adults in 2017) in Erbil city, Iraq, the prevalence of overweight was 33.4% and obesity 40.9%, and in Basrah, Southern Iraq (2003–2010),

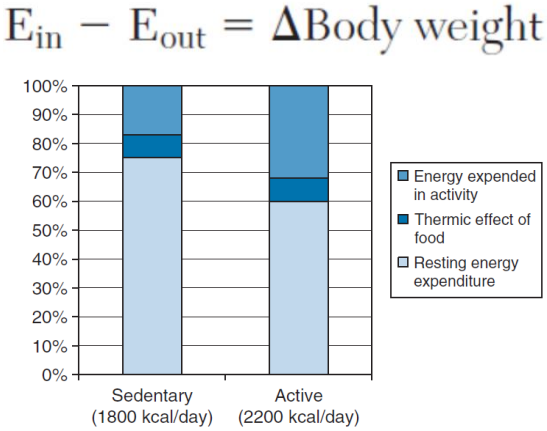
overweight/obesity was 55.1%. Among nonpregnant women (N = 200, ≥18 years) attending outpatient clinics in Baghdad, Iraq, 39% were overweight and 37% had obesity, and among female relatives of primary care attendees (N = 440) in Baghdad, the prevalence of obesity was 35.2%. In a national STEPwise approach to surveillance (STEPS) survey in 2005–2006 in Iraq (25–65 years), the prevalence of overweight/obesity was 66.9%.



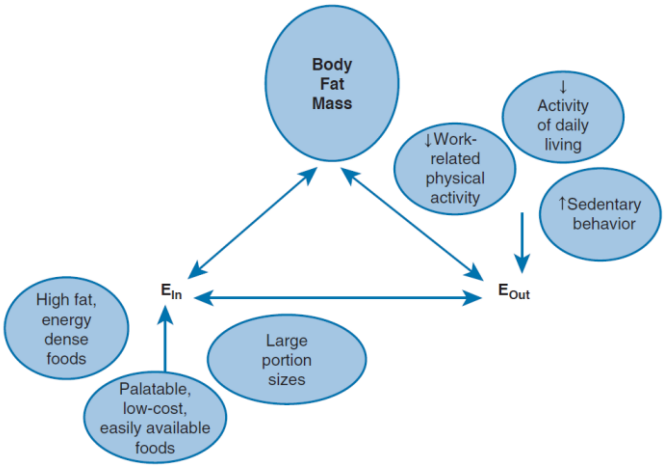
Causes of overweight and obesity

Overweight and obesity result from an imbalance of energy intake Energy-in from diet and beverages and energy expenditure (Energy-out) from physical activity. Components of total energy expenditure (TEE) in sedentary & active persons is shown in this first figure.

Energy-in and energy-out contributing factors of obesity are shown in the second figure.



Energy in factors include high fat energy dense foods, palatable low-cost, easily available foods and large portion sizes of the food.



Energy Stored in the Body

The body stores energy as protein, carbohydrate, and fat. The body has very limited storage capacity for both protein (in muscle and organs) and carbohydrate (as glucose and glycogen-in muscle & liver). A lean adult has approximately 35 billion adipocytes, each containing 0.4 to 0.6 g of triglyceride. The capacity of the body to store fat in adipose tissue depots is virtually unlimited. Triglycerides are a fivefold better fuel per unit mass than glycogen. Triglycerides are stored very compactly inside the fat cell, thereby accounting for 85% of its weight. (9.3 Kcal).

In obese persons, triglyceride stores can increase tremendously because of both increased adipocyte size and increased adipocyte cell number.

Genetic factors contributing to obesity:

Obesity tends to run in families but shared environmental factors (meals and level of activity) probably contribute more to obesity than common genetic factors and the current, rapid increase in obesity prevalence cannot be explained by the genetic factors changing so quickly. However, it is likely that some individuals are genetically more susceptible to the effects of an obesogenic environment.

Diagnosis of obesity:

The diagnosis of overweight and obesity is made by measuring people's weight and height and by calculating the BMI: weight (kg)/height² (m²).

1. **BMI**

The BMI is a measure of body fat based on height and weight that applies to adult men and women. The BMI categories for defining obesity vary by age and gender in infants, children and adolescents. The simplest and most widely used classification for obesity in adults is based on the BMI).

Classification	BMI (kg/m^2)	Risk of comorbidities
Underweight	<18.5	Low (but risk of other clinical problems increased)
Normal range	18.5–24.9	Average
Overweight (preobese)	25.0–29.9	Mildly increased
Obese	≥30.0	
Class 1	30.0–34.9	Moderate
Class 11	35.0–39.9	Severe
Class 111	≥40.0	Very severe

2. **Waist circumference:**

Waist measurement is a simple check to tell if you're carrying excess body fat around your middle. Your waist measurement is an indicator of the level of internal fat deposits that coat the heart, kidneys, liver, digestive organs and pancreas. This can increase the risk of heart disease and stroke.

Indicator	Cut-off points	Risk of metabolic complications
Waist circumference	>94 cm (M); >80 cm (W)	Increased
Waist circumference	>102 cm (M); >88 cm (W)	Substantially increased
Waist–hip ratio	≥0.90 cm (M); ≥0.85 cm (W)	Substantially increased

M, men; W, women

Common health consequences of obesity:

Obesity can lead to increased risk of type 2 diabetes and heart disease, it can affect bone health and reproduction, it increases the risk of certain cancers. Obesity influences the quality of living, such as sleeping or moving.

Clinical consequences

Obesity is associated with a higher risk of death and morbidity. The life expectancy of men and women with a BMI of >45 kg/m2 aged 20–30 years is 13 and 8 years lower, respectively, than that of those with a BMI of 24 kg/m2.

1. Metabolic: Diabetes type 2 (insulin resistance), hyperlipidaemia, hypertension, stroke, gall stones, breast and colon cancer, infertility (men and women), and polycystic ovary syndrome.
2. Physical: Osteoarthritis, chronic back pain, respiratory problems, decrease mobility and accidents, sleep apnoea, skin problems.
3. Psychosocial: Depression, low self-esteem, social isolation, poor employment status, impaired relationships.

Childhood and adolescent obesity have adverse psychosocial consequences; it affects school performance and quality of life, compounded by stigma, discrimination and bullying. Children with obesity are very likely to be adults with obesity and are also at a higher risk of developing NCDs in adulthood.

Management of obesity

It is recommended that the additional carbohydrate energy makes individuals fat by suppressing fat oxidation (Hellerstein,2001). Americans eat too many calories, even though they eat less fat than was

consumed 30 years ago (Willett,2002). Based on the evidence, to treat obesity, it is important to reduce dietary fat and to reduce total calories.

Years ago, an energy-restricted diet represented the only treatment. Eventually lifestyle modifications added. Finally, the importance of physical activity was recognized, not just as a component for weight loss but also as an essential element for weight maintenance after weight loss.

The goal of treatment should be refocused from weight loss alone to weight management. Achieving ideal body weight or percentage of body fat is not always realistic or desirable, and under some circumstances it may not be appropriate at all.

The lines of management of overweight and obesity includes the following:

1. Nutrition (dietary) Management: this includes the following:

    - Energy intake reduction
    - Appropriate nutrient supplementation
    - Nutrition, meal planning and portion-size reduction

The goal of all dietary management in obesity should be to help the individual to reduce their energy intake to an acceptable level while consuming a diet that is adequate in all other nutrients, compatible with good health, practical to follow and can be reconciled with their life style.

An energy reduction can be achieved by reducing or eliminating the intake of concentrated calories particularly from fatty foods, increasing fruit and vegetable intake to a minimum of five portions per day and maintaining intake of whole grain cereals (whole wheat & beans), lean meat or fish, and low-fat dairy products. This regime is ideal for encouraging gentle weight loss of 0.5–1.0 kg/week accompanied by a long-term change in eating habits and is suitable for well-motivated individuals.

2. Medical Management

    - Lifestyle modification (in crease exercise)
    - Psychological therapy when necessary
    - Medications
    - Surgery

Lifestyle modification strategies:

1. *Setting easy-to-achieve short-term Goals.*

- Increase number of minutes of walking on weekends
- Include one fruit at lunch

2. *Self-Monitoring*

- Food and activity records.
- Regular weigh in (weekly)

3. *Stimulus control*

- Shop when not hungry & with a grocery list
- Make eating a singular activity.

4. *Confronting Barriers*

- Planning ahead (e.g., healthful snacks on hand)
- Daily meditation & relaxation.

5. *Social Support*

- Organized commercial support meetings
- Family, friends support system

Prevention of overweight and obesity:

Preventing overweight and obesity is crucial for maintaining overall health and well-being. These conditions are associated with a range of health problems, including heart disease, diabetes, and certain cancers. Implementing effective prevention strategies is essential, and they can be divided into several key areas which are written bellow:

Promoting healthy eating habits is vital. This includes educating individuals about the importance of a balanced diet rich in fruits, vegetables, whole grains, and lean proteins. Encouraging the reduction of processed foods, sugary drinks, and high-fat foods can also be beneficial. Providing practical tips on portion control and mindful eating can help individuals make healthier food choices and following principles of a healthy food program. The principles of a healthy food program include the following:

1. Eat a lot: (unlimited quantities!) of raw Vegetables (including Salad) that have a negative caloric effect. They include: sweet red peppers, raw peas, tomatoes, cucumbers, and sprouts. Usually, the 500 gm is less than 100 calories of food is enough.

2. Eating large quantities of high-nutrient foods with no deprivation of any food, eat every 2-3 hour, eat some foods & limit others, and long-term weight loss: average weight loss= 250-500 gm/ Week.

3. Beans or Legumes have the properties of stabilizing blood sugar, blunt your desire for sweets, and prevent mid-afternoon cravings.
   Example of legumes: chickpeas, black-eyed peas, black beans, cowpeas, green peas, lima beans, pinto beans, lentils red kidney beans, soybeans, and white beans.

4. Fruits: Fruits are very important nutrients that include vitamins, minerals, antioxidants and healthy carbohydrates. It is recommended to eat fresh fruit: (3-4)/ day, frozen fruit is permissible, but avoid canned fruit because it is not as nutritious.

5. Meats: are rich sources of protein and minerals. It is recommended to eat fish: 1-2 servings per week Chicken: one serving per 1-2 weeks, while red meat: one serving per month.

End of Module 6..