Nutrition & Diet Therapy
Third Stage
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Lecture One : Overview of Nutrition

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Basic Concepts of Nutrition

- **Nutrition science:** comprises the body of scientific knowledge that governs nutrient requirements for all aspects of life for body maintenance such as growth, activity, reproduction, and maintenance.
- **Nutrition:** is the result of the processes whereby the body takes in and uses food for growth, development, and the maintenance of health. These processes include digestion, absorption, and metabolism.
- **Nutrient:** a chemical substance obtained from food and needed by the body for growth, maintenance, or repair of tissues. Many nutrients are considered essential, the body cannot make them and they must be obtained from food.

Basic Concepts of Nutrition

- **Food:** any substance taken into the body that will help to meet the body's needs for energy, maintenance, and growth.
- **Diet:** refers to whatever you eat and drink each day. Thus it includes the normal diet you consume and the diet people consume in groups. Diet may also be modified and used for ill persons as part of their therapy (therapeutic diets).
- **Optimum nutrition:** the state of receiving and utilizing essential nutrients to maintain health and well-being at the highest possible level. It provides a reserve for the body.
- **Malnutrition:** means an undesirable kind of nutrition leading to ill-health. It results from a lack, excess or imbalance of nutrients in the diet. It includes undernutrition and overnutrition.

Basic Concepts of Nutrition

- **Overnutrition:** an excessive intake of one or more nutrients, frequently referring to nutrients providing energy (kcalories).
- **Undernutrition:** is a state of an insufficient supply of essential nutrients or a deficiency of one or more nutrients, including nutrients providing energy (calories).
- **Health:** the state of complete physical, mental, and social well-being; not merely the absence of disease and infirmity.
- **Wellness:** integrates body, mind, and spirit should be the main goal in life.

Basic Concepts of Nutrition

- **Nutritional status:** One's physical condition as determined by the diet or condition of the body as it relates to the consumption and utilization of food.
- **Good nutritional status:** intake of a balanced diet containing all the essential nutrients to meet the body's requirements for energy, maintenance, and growth.
- **Poor nutritional status:** an inadequate intake (or utilization) of nutrients to meet the body's requirements for energy, maintenance, and growth.
- **Kilocalorie (kcalorie, kcal):** technically correct term for unit of energy in nutrition, equal to the amount of heat required to raise the temperature of 1 kg of water 1°C.

Dietary Supplements: are product that contains a vitamin, a mineral, an herb or other plant product, an amino acid, or a dietary substance that supplements the diet by increasing total intake. According to scientific evidence, some dietary supplements, such as vitamins and certain herbs, can have beneficial effects on health. However, results of scientific testing also indicate that many popular dietary supplements are not helpful and may even be harmful.

Phytochemicals: chemical substances finding in some foods, particularly in plants but that are not nutrients and having healthful benefits. Plants make hundreds of phytochemicals (phyto=plant). Caffeine, for example, is a phytochemical naturally made by coffee plants that has a stimulating effect on the body. Many phytochemicals are antioxidants that may reduce risks of heart disease and certain cancers. An antioxidant protects cells and their components from being damaged or destroyed by exposure to certain environmental and internal factors. Not all phytochemicals, however, have beneficial effects on the body; some are toxic (poisonous) or can interfere with the absorption of nutrients.

Good nutritional status	Poor nutritional status
Alert expresion	Apathy
Shiny hair	Dull, lifeless hair
Clear complexion with good color	Greasy, blemished complexion with poor color
Bright, clear eyes	Dull, red-rimmed eyes
Pink, firm gums and well-developed teeth	Red, puffy, receding gums and missing or cavity-prone teeth
Firm abdomen	Swollen abdomen
Firm well-developed muscles	Underdeveloped, flabby muscles
Well-developed bone structure	Bowed legs, " pigeon" breast
Normal weight for height	Overweight or underweight
Erect posture	Slumped posture
Emotional stability	Easily irritated, depressed, poor attention span
Good stamina, seldom ill	Easily fatigued, frequently ill
Healthy appetite	Excessive or poor appetite
Healthy, normal sleep habits	Insomnia at night, fatigued during day

Assessment of Nutritional Status

Assessment: gathering of data about a person in order to logically identify his or her physical, psychological, social, and economic assets and liabilities. There are four major techniques to assess nutritional status:

1- Physical Findings: There are many clinical signs of good and poor nutrition. Although some of these signs are not related to a person's nutritional status, they serve as a general indicator of health. Data from a physical assessment are considered objective data and helpful to the health practitioner.

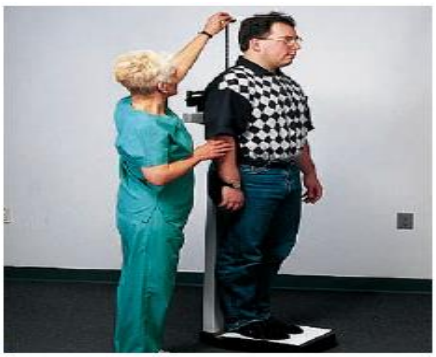
2- Anthropometric Measurements: Assessment of growth and development by studying anthropometric measurements (physical measurements of the human body) provides important information about the nutritional status of infants, children, adolescents, and pregnant women. Standard measurements include weight, height, head circumference, midarm circumference, chest circumference, and skin-fold thickness.

3- Laboratory Data: Laboratory tests are generally used to determine internal body chemistry. Although determined with great care and accuracy, these tests are influenced by many factors and are subject to different interpretations. The most common and useful biochemical techniques in evaluating malnutrition employ measurements of hemoglobin, blood cell counts (hematocrit), nitrogen balance, and creatinine excretion. The measurements are obtained from serum and plasma samples.

4- Diet History and Methods of Evaluating Data: The type of data needed for health and diet history is subjective and involves interviews and food records. The accuracy of both approaches depends on the skill of the interviewer and the client's memory, perception, and cooperation. From an interview, information can be obtained on the client's food intake history, presence of disorder, and drug usage. It is important that the interviewer learn something about the client's life and the factors that influence his or her eating habits. Once the data are collected, we can determine the nutrient content of the diet and evaluate the person's dietary intake using available references such the Dietary Guidelines. At present this is easily done with computer software designed for that purpose.

Figure 1-1 *Good nutrition shows in the happy faces of these children*

Figure 1-2 *The poor-quality hair, mottled complexion, dull expression, spindly arms and legs, and bloated abdomen of this baby girl exemplify many signs of malnutrition.*



A

B

C

D

Figure 1-3 (A) Height is one anthropometric measurement used in the nutrition assessment.
(B) Weight is an anthropometric measurement used in the nutrition assessment.
(C) Head circumference is an anthropometric measurement used to assess Brain development during the first year of life.
(D) Skinfold is an anthropometric measurement used to assess lean muscle mass versus fat

TABLE 1.1 *Major Functions of Nutrients in the Body*

Nutrient	Major Functions
Carbohydrates	Energy (most forms)
Lipids	Energy (fat)
	Cellular development, physical growth and development
	Regulation of body processes (certain chemical messengers, for example)
	Absorption of certain vitamins
Proteins	Production of structural components, such as cell membranes, and functional components, such as enzymes
	Cellular development, growth, and maintenance
	Regulation of body processes (certain chemical messengers, for example)
	Energy
Vitamins	Regulation of body processes, including cell metabolism
	Maintenance of immune function, production and maintenance of tissues, and protection against agents that can damage cellular components
Minerals	Regulation of body processes, including fluid balance and metabolism; formation of certain chemical messengers; structural and functional components of various substances and tissues; necessary for physical growth, maintenance, and development
Water	Maintenance of fluid balance, regulation of body temperature, elimination of wastes, and transportation of substances
	Participant in many chemical reactions

Major Food Groups

1- Grains: The grains group includes wheat, rice, oats, corn, barley, and all foods made from these grains such as bread, pasta, breakfast cereals, oatmeal, cornmeal, tortillas, and grits.

2- Vegetables: The vegetable group includes all fresh, frozen, canned, and dried vegetables and vegetable juices.

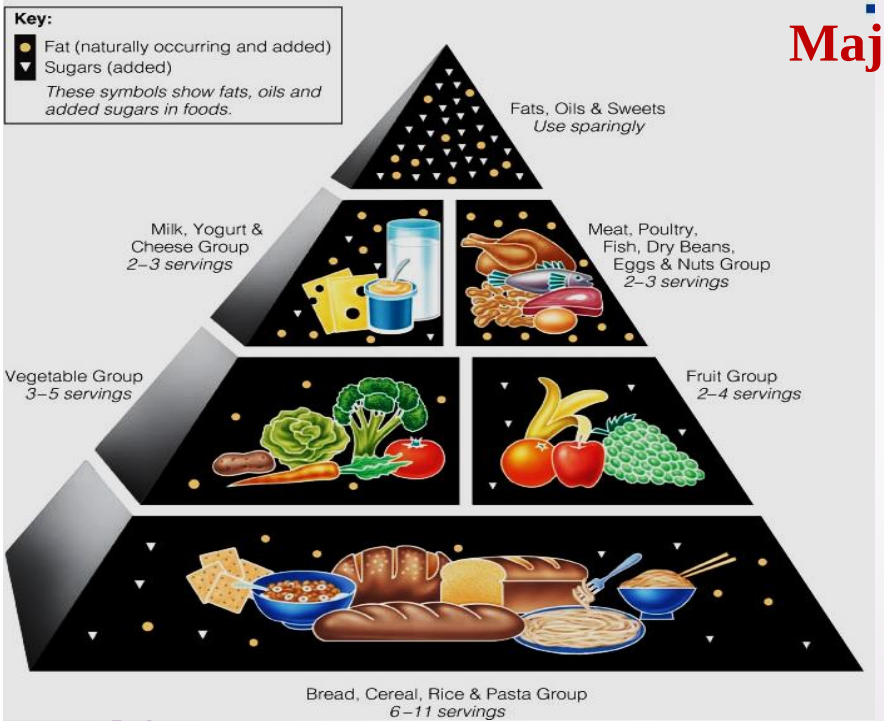
3- Fruits: The fruit group includes all fresh, frozen, canned, and dried fruits and fruit juices.

4- Milk and milk products: The milk group includes all milk types, and their products such as yogurt, cream, and cheese.

Major Food Groups

5- Meat and meat substitutes: Include fish, meats, poultry, and eggs, as well as meat substitutes like dry beans, peas, nuts, and seeds.

6- Fats and Oils: Oils and fats were obtained from many different plants, animals and from some fish. The plant source include corn, olive, soybean, sunflower. Some foods are naturally high in oils such as nuts, olives, avocados, and some fish.



Major Food Groups

1- Grains

2- Vegetables

3- Fruits

4- Milk and milk products

5- Meat and meat substitutes

6- Fats and Oils

Case in point: Gary fending for himself

- Gary, a 7-year-old Caucasian boy, was discovered searching a garbage can by a police officer. The officer noticed that Gary was dirty, unkempt, and thin. His skin was pale. Gary was taken to the police station, where he was turned over to social services. Gary told social services that his mother had been sick and was taken to the hospital; he had not seen her for many months. He did not know what hospital she was in, and he had been alone all this time. He told the social worker that he had run out of food immediately after she left; he had been able to survive by searching behind restaurants and in garbage bins. Social services brought Gary to the local hospital, and upon examination, it was found that Gary had a distended abdomen, serosanguinous sores on his body, and swollen and painful lower limbs. Gary limped and found walking very tiring.

- **ASSESSMENT**

1. Identify three distinguishing signs of malnutrition.
2. What would you introduce first into Gary's diet?
3. How frequently would you offer nutrition and how large a portion?
4. What other signs of malnutrition would you expect to find?

- **DIAGNOSIS** 5. Write a nursing diagnosis for Gary.