INTRODUCTION TO NUTRITION AND DIETETICS
NTD 201 (3 Credits)

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Course Outline

- History and definition of the Science of Nutrition and Dietetics.
- Malnutrition: Undernutrition and Overnutrition;
- Adequate diets; nutrient needs/requirements.
- Food guide Pyramid/MyPlate.
- Effects of food preparation on nutrients and anti-nutrients
Course Outline

- The nutrients, (micro- and macro-nutrients) their functions and sources, classification and deficiency symptoms
- Other components in foods, e.g. nutraceuticals and phytochemicals as food components.
Definition of the Science of Nutrition and Dietetics.

- Why is the knowledge of nutrition important?

  Nutrition is related to health and disease

- Do we live to eat or eat to live?
“Today, more than 95% of all chronic disease is caused by **food choice**, **toxic food ingredients**, **nutritional deficiencies** and **lack of physical exercise**.”

- Mike Adams, the Health Ranger
Definition of the Science of Nutrition and Dietetics.

- **Food** is any substance whether processed or raw, that is intended for human consumption.
- The basic function of food is to keep us alive and healthy; to grow and to reproduce.

- **Diet** is the kinds of food that a person, animal, or community habitually eats.
- Nutrition is defined as **“the science of food and its relationship to health”**.
- Dietetics is **“the practical application of the principles of nutrition”**; It includes the planning of meals for the healthy and sick.

- The science of human nutrition deals with all the effects of any component found in food, on people.
Definition of the Science of Nutrition and Dietetics.

- Nutrition refers to nourishment that sustain life
- Nutrition is a science that deals with the intake of food and how the body handles the substances (nutrients) in the foods consumed for growth, development and maintenance of life.

- “It is the intake of food, and the interplay of biological, social and economic processes that influence the growth, function and repair of the body" (FAO, 2014a)
Definition of the Science of Nutrition and Dietetics.

- The science and practice of nutrition involves a spectrum of other basic and applied scientific disciplines.
- These include: molecular biology, genetics, biochemistry, chemistry, physics, food science, microbiology, physiology, pathology, immunology, psychology, sociology, political science, anthropology, communication and economics.
Definition of the Science of Nutrition and Dietetics.

- Knowledge of nutrition is based on two fundamental areas of science:
  - Physical
  - Behavioral Sciences

- The physical sciences include Biochemistry and Physiology, that help us to know how nutrition is related to our physical health and well-being.

- The behavioral sciences like psychology help us to understand how nutrition is interwoven to the unique human nature.
The science of nutrition include:

1. The physiological and biochemical processes involved in nourishment—how substances in food provide energy or are converted into body tissues,
2. The diseases that result from insufficiency or excess of essential nutrients (malnutrition).
3. Nutrition is also about why people choose to eat the foods they do, even if they have been advised that doing so may be unhealthy.
Definition of the Science of Nutrition and Dietetics.

- **Nutritionist**: a person who specializes in the study of nutrition.
- **Dietitian**: a person trained in nutrition, food science, and diet planning.
- Dietitians interpret the scientific evidence concerning human nutritional requirements and use this information to influence food intake and food choices within the population.
Definition of the Science of Nutrition and Dietetics.

- **Registered dietitian (RD):** a person who has completed a minimum of a bachelor’s degree from an accredited university or college, has completed approved course work and a supervised practice program (completed a year’s clinical internship or the equivalent), has passed a national examination, and maintains registration through continuing professional education
1. Clinical Nutrition/Dietetics: Professionals in this area work in the hospitals, clinics, or private practice. They counsel individuals from a biomedical-disease-behavioral paradigm.

2. Community Nutrition: Professionals in this area have additional skills from the psychosocial and behavioral sciences. Community nutrition is the “practical application of the nutritional knowledge to promote health and wellbeing of individuals, groups or community”.

AREAS OF NUTRITION PRACTICE
3. Public Health Nutrition: These cover the health and care practice areas. They are also interested in food security and environmental issues of public health interest. These professionals are responsible for nutrition surveillance; and the design, implementation and monitoring of dietary guidelines that address relevant public health problems. They are also involved in the formulation and application of nutrition policy in a country.

There could be overlap in the practice areas of these specialities.
Career/Job opportunities for the Nutritionists

- Nutrition Educator
- Research Nutritionists
- Public Health Nutritionists
- Clinical Nutritionist/Dietitian
- Industrial Nutritionist
- Commercial Food Service Managers
- Nutritionists in Government and Non-governmental Development Organizations
- Nutrition Entrepreneurs
AIM OF THE NUTRITION AND DIETETICS PROFESSION

- To promote health and quality of life in individuals through nutritional measures aimed at prevention as well as treatment.
Malnutrition

- Malnutrition is a condition characterized by inappropriate quality, quantity, digestion, absorption, or utilization of ingested nutrients. It includes: undernutrition—low food intake (calorie deficiency) leading to growth suppression or other deficiency signs and overnutrition—consumption of too much food and/or single nutrients leading to specific toxicities.

- The World Health Organization (WHO) defines malnutrition as "the cellular imbalance between the supply of nutrients and energy and the body's demand for them to ensure growth, maintenance, and specific functions."
CONCEPTS OF MALNUTRITION – UNDERNUTRITION AND OVER NUTRITION

- Malnutrition occurs when there is an imbalance in the nutrients that are entering the body. It is a severe health threat that can cause undernutrition apparent in stunting or wasting, overnutrition evident in those overweight and obese, and micronutrient deficiency that is not always physically obvious and is also know as "hidden hunger"(IFPRI, 2016).
CONCEPTS OF MALNUTRITION – UNDERNUTRITION AND OVER NUTRITION

- Micronutrient deficiencies occur when intake of micronutrients is inadequate or when disease processes prevent adequate absorption of micronutrients available in the diet. Lack of adequate dietary diversity tends to lead to micronutrient deficiency.

- Malnutrition in all its ramifications is evident on one in three people worldwide and about 830 million have a daily problem of hunger.
Malnutrition: Undernutrition and Overnutrition

- Malnutrition erodes human capacity and reduces productivity. It affects survival and health, education, and the economy of the nation. Hence, nutrition is now seen as a basic human right, not only essential for human development, but also as an outcome of development.
OVER NUTRITION/NON-COMMUNICABLE CHRONIC DISEASES (NCCDS)

- There is an emerging epidemic of diet related non-communicable chronic diseases hitherto seen only in industrialized and developed countries.
- These conditions have been associated with excessive consumption of one or more nutrients.
- They include diabetes, hypertension, obesity, cardiovascular disease (CVD), cancers, osteoporosis and dental disease.
- The coexistence of under-nutrition and over-nutrition within the same population is referred to as the “double burden of diseases”
Multiple burden of diseases

- We are now seeing a previously unknown phenomenon in some countries, with all three forms of malnutrition evident within the same population, and often in the same individual across the lifecycle. Currently, every single country in the world faces at least one form of malnutrition (IFPRI, 2016).
NUTRITION AND NUTRIENTS

- Nutrition is emerging as an important tool for promoting health and for prevention or reducing the risk diseases.

- *Nutrients* are chemical substances present in food that provides nourishment essential for growth and the maintenance of life.

- Basically, the foods we eat contain six vital nutrients (carbohydrates, proteins, fats, minerals, vitamins and water) that are essential for growth, repair and maintenance of the body.
Apart from the six major classes of nutrients in foods, there are other substances that are beneficial in the maintenance of good health.

These include dietary fiber, phytochemicals, antioxidants, essential fatty acids, oligosaccharides, enzymes and microorganisms.

Requirements for these nutrients have been set for different ages, sexes and physiological groups.
Balanced diet refers to a meal/diet that contains all the six classes of nutrients in their right proportions.

An adequate diet is that which is balanced in nutrients, contains sufficient amounts of other dietary components that are necessary for good health and meets the individual’s nutrient requirements.

Adequacy means that the diet provides sufficient energy and enough of all the nutrients to meet the needs of healthy people.
A healthy/adequate diet is one which:

1. Fulfills energy needs (*macronutrients*)
2. Provides sufficient amounts of essential nutrients (*micronutrients*)
3. Reduces risk of disease
4. Is safe to consume (*low contaminants or potentially harmful added substances*)
Nutrient needs/ Requirements.

- People need to eat to survive, but health-conscious individuals want to do more than survive.
- They want to choose diets that will optimize their health.
- How do we know what an optimal diet is?
  - It should contain the right amount of each nutrient.
- What is the right amount?
  - It is the amount needed to prevent a deficiency,
  - the amount needed to maintain a certain nutritional level in the blood,
  - the amount that minimizes disease risk, that maximizes immune function, or extends life span.
Nutrient needs/ Requirements.

- Standards for nutrient intake - refers to various criteria for assessing food and nutrient intake of individuals and groups.
- Examples include:
  - Dietary Reference Intakes (EAR, RDA, AI and UL)
  - various dietary guidelines e.g. dietary guidelines for Nigerians? For Americans
  - My pyramid food guide system
  - MyPlate etc…
Nutrient needs/ Requirements.

- **Dietary Reference Intakes - DRIs**
  - Recommendations from the Food and Nutrition Board of the National Academy of Sciences
  - Defined as “reference values that are quantitative estimates of nutrient intakes to be used for planning and assessing diets for apparently healthy people”

- DRI is a set of four reference values for the intake of nutrients and food components that can be used for planning and assessing the diets of healthy people- EAR, RDA, AI, UL.
Nutrient needs/ Requirements.

- **EAR** – Estimated Average Requirement – daily dietary intake that is estimated to meet the nutrient requirement of 50% of healthy individuals in a particular life stage and gender group.

- It is the basis for setting RDA. If EAR cannot be set, then RDA cannot be established.

- **RDA** – Recommended Dietary Allowance – the average daily intake level that is sufficient to meet the nutrient requirement of nearly all (97 – 98%) healthy individuals in a particular life stage and gender.

- The RDA is set at + 2SDs of EAR or EAR x 1.2.
Nutrient needs/ Requirements.

- **AI** – Adequate intake – the recommended daily dietary intake level that is assumed to be adequate and that is based on experimentally determined approximations of nutrient intake by a group(s) of healthy people.

- **AI** is an observational standard that is used when insufficient research/data is available to establish RDA. This value lies somewhere between RDA and UL.

- **UL** – Tolerable Upper Intake Level- the highest level of daily nutrient intake that is likely to pose no risk of adverse health effects to almost all apparently healthy individuals in the general population in a specific life stage.
Nutrient needs/ Requirements.

- The DRIs recommend amounts of specified nutrients and food components, but they do not tell you how much of which foods you should choose to meet these.

- For individuals to follow the recommendations for a healthy diet and help them make the right food choice, food are described in food group.

- These are based on nutrients the food supply most abundantly and recommendations on the servings from each group needed to provide a healthy diet.
THANK YOU