UNIVERSITY OF NAIROBI
SCHOOL OF PUBLIC HEALTH

Course: Public Health Nutrition

MBCHB Level 2

Session 1: Introduction

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Introduction

- Nutrition as the foundation for health & development, is defined as:
  - ***"a process whereby living organisms utilize food for maintenance of life, growth & normal functions of organs and tissues and the production of energy"*** **(WHO Def.)**
- About 70% of all childhood mortality in developing countries is due to five major conditions which includes malnutrition.
- Good nutrition therefore:
  - Is the cornerstone for survival, health and development for current and succeeding generations.
  - Is achieved by eating the right quality and quantity of food all the time.

- Health care providers are well placed not only to ensure appropriate nutritional care & support of the sick but also to promote appropriate nutrition at facility level through support for implementation of the priority nutrition interventions within the health sector.

- The course aims at equipping medical practitioners with the requisite knowledge and skills necessary to ***support and promote implementation of nutrition interventions at facility and community level.***
- This is in addition to liasing with nutritionists & dieticians within health facilities to ensure appropriate dietary management of patients.

VISION

- The course also ensures that medical practitioners are knowledgeable of the critical role of diet in preventive & promotive health, & who are able and are motivated to provide leadership in implementation of strategies (facility and community level) aimed at realization of optimal nutrition for health and development of all.

Overall Aim of Nutrition Course for Medical Students

- The specific objectives of this course:
- To equip medical students with knowledge on: nutritional requirements throughout life cycle; multiple causes of malnutrition at community level; assessment methods of the resultant nutritional diseases; management as well as prevention and intervention strategies.

COURSE OUTLINE

Course outline

- **A: Introduction**
- Introduction - Basic nutrition: Nutrients: Types, Sources and role in the body.
- Social cultural factors in nutrition
- Food security
- **B: Nutrition in the lifecycle**
- Maternal nutrition in the lifecycle
- Infant and childhood nutrition
- Nutritional requirements during adolescence
- Nutrition of the elderly

C: Nuritional disorders of Public Health

- Malnutrition: Overview of causes (Food/nutrition security, care & public health factors)
- Malnutrition and infections
- Protein energy malnutrition (PEM):
- Nutritional anaemia
- Vitamin A deficiency disorders (VADD)
- Iodine deficiency disorders (IDD's)
- Zinc deficiency disorder

D: Community Nutrition Interventions

- Interventions – Supplementation and food fortification
- Interventions- Nutrition education and Nutritional Rehabilitation

NUTRIENTS

- Value of food depends on its nutrient content.

- Two Major Types: Macro- & micronutrients

1. **Macronutrients:** Are needed in large amounts in the diet & amounts are measured in kilograms (kg) or grams (g); & are the main energy-yielding nutrients.
   - Carbohydrates
   - Proteins
   - Fats & Lipids
   - Water

Micronutrients

- Are needed to regulate body processes
- Required in small amounts in diet.
- Amounts are expressed as milligrams or micrograms
- Include: Minerals, Vitamins & phytochemicals

Carbohydrates

Functions of carbohydrates:

1. The main source of fuel for the body cells
2. Sparing protein for use as energy source
3. Prevents formation of ketone bodies which result from incomplete metabolism of fats in the liver (*ketosis) e.g. in starvation or type 1 diabetes*

- Two Types: *fast & slow releasing sugars*

1. "**Fast-releasing"/simple sugars** (Sugar, honey, malt, sweets, lucozade & most refined foods, mainly mono &disaccharides)
    - Give a sudden burst of energy, followed by a slump
    - Refined foods lack vitamins & minerals for the body to use them properly
    - Give "empty calories", with no nutrients
    - Perpetual use of these foods is not healthy & should be avoided

Carbohydrates (cont…)

2. **“Slow-releasing”/Complex sugars** (Whole grains, vegetables & fresh fruits & legumes & fibre)
   - Have more complex carbohydrates & fibre
   - Generally not sweet to the taste like simple sugars
   - release of sugar is slow.
   - Are more healthy & Ideally, should make up ~70% of total daily calorie intake

Carbohydrates (Cont…)

- For many people in developing world, carbohydrate is the main source of energy, accounting for up to 80% of food eaten – staple food.

For Thought & Discussion:

- ***What is your main source of energy***

Take 1 minutes to list down at least 3 carbohydrate foods you have eaten since morning

- *For discussion/presentation*

Lipids (Fats & oils)

- Lipid is the chemical term for fats & oils;
- Are made up of:
    1. Fatty acids
    2. Glycerides;
    3. Phospholipids;
    4. Sterols;.

Food Sources of fat

Vegetable oils, margarine, butter, coconut, eggyolk, groundnuts, fish, dairy fat.

Physiological Functions of Fats

1. *Energy & heat* (gives x2 energy than cabs: 1 g fat== 38 Kilojoules and, 1 g cabs = 17 Kilojoules)

2. *Provide essential fatty acids* for membrane structure, cholesterol transport, lower serum cholesterol level and other body functions;

3. *Regulation of body processes* e.g blood clotting, immune functions, blood pressure etc (by eicosanoids from fatty acid metabolism)

4. *Food satiety:* Flavor from fats gives a feeling of satisfaction that lasts longer than that of cabohydrates.

Functions of Fats (Cont…)

5. Serve as *packing material & support* the kidneys, eyes, nerve sheaths & most internal organs.

6. Help in *absorption & transportation of fat-soluble vitamins* in the gastrointestinal tract & bloodstream.

7. Act as a *lubricant in the intestine & facilitate* the passage of food along the digestive tract.

8. Excess fat is stored as *body fat.*

Energy Needs

WHO Def. of energy requirements:

"the level of energy intake that will balance energy expenditure when the individual has a body size & composition & a level of physical activity consistent with the long-term good health; & that will allow for the maintenance of economically necessary & socially desirable physical activity".

The diet must supply enough energy to maintain normal growth & bod functions, to supply the demands of muscle activity & to repair damage induced by energy or injury.

For most sedentary adults, the need is met by an intake of 2000-3000Kcal.

Energy Requirements Vary with:

- **Body size:** Big people need more calories than small ones. But if they are very fat, this may not be true as fatty tissue does not use up calories.

- **Age:** Children need extra calories for growth. Old people need fewer calories than young ones of the same size because their body processes & physical activity gradually slow down.

Energy Requirements(Cont...)

- **Climate:** In a very warm climate fewer calories are usually needed largely because people often reduce their physical activity in hot weather.

- **Pregnancy**: A woman requires extra calories for the growth of the foetus and associated tissues.

- **Physical Activity:** If physical activity is greatly reduced, the extra calories needed may be very few, or none, but this does not often happen in rural families in Africa.

- **Lactation**: A woman breast feeding her child needs extra calories to produce milk.