Nursing Level-IV

Based on December 2018, version 1 Occupational Standards and Dec, 2019 version 1 curriculum.

Module Title: - Managing nutritional problems and providing dietary service

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LG #38	LO#1-Identfy different food elements

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Introduction to nutrition
- Classifications of nutrients
- Nutritional guideline
- Describing elements of food
  - ✓ Components elements of food
  - ✓ Source elements of food
  - ✓ Classification elements of food
  - ✓ Composition and function elements of food

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Describe Different **classifications of nutrients**
- Describe Different elements of food
- identify the source, components , composition and function of food

Learning Instructions:

1. Read the information written in the “Information Sheets”.
2. If you earned a satisfactory evaluation proceed to next module. However,if your rating is unsatisfactory, see your teacher for further instructions.
3. Read the “Operation Sheet” and try to understand the procedures discussed.
4. Practice the steps or procedures as illustrated in the operation sheet. Go to your teacher if you need clarification or you want answers to your questions or you need assistance in understanding a particular step or procedure
5. Do the “LAP test” (if you are ready). Request your teacher to evaluate your performance and outputs.Your teacher will give you feedback and the evaluation will be either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work.But if satisfactory you can proceed to the next Learning Guide.

Information sheet 1-Introduction to nutrition

1.1 Introduction to nutrition

In your high school class you learned about nutrition, nutrients, food and food choices. In this session, you will learn about each nutrient in more detail. You will learn about the major categories of nutrients, the main sources of these, their function, and how our body uses each of these nutrients for healthy growth and development. There are seven main classes of nutrients that the body needs. These are carbohydrates, proteins, fats, vitamins, minerals, fibre and water. It is important that everyone consumes these seven nutrients on a daily basis to help them build their bodies and maintain their health. Deficiencies, excesses and imbalances in diet can produce negative impacts on health, which may lead to diseases. This session will help you to explain to families and individuals in your community the importance of consuming a healthy and balanced diet, and how to do this with the resources available to them.

Nutrition: is the science of food, the nutrients and other substances therein, their action, interaction and balance in relation to health and disease, and the process by which the organism ingests, digests, absorbs, transports, utilizes and excretes food substances It also deals with social, cultural, physiological and physiological implications of food and eating

1.2 **Definition of Terms (Terminology)**

- **Nutrition**: is the science of food, the nutrients and other substances therein, their action, interaction and balance in relation to health and disease, and the process by which the organism ingests, digests, absorbs, transports, utilizes and excretes food substances
- **Human Nutrition:** scientific discipline concerned with access and utilization of food and nutrients for life, health, growth, development and well-being
- **Public health nutrition:** studies the relationship between dietary intake and disease at community level

- **Dietetics/clinical nutrition:** science/art of applying the principles of nutrition in feeding tailored to individual needs
- **Diet:** is the sequence of meals in a day (per 24 hours)
- **Food:** is anything edible (defined by culture/religion)
- **Roughage:** fiber which enable the body to get rid of waste products, which would otherwise become poisonous to the body.
- **Nutrient**: is an active ingredient in the food that play specific structural or functional role in the body's lively activity. More than **50** nutrients are currently identified.
- **Macronutrients:** nutrients required by our body in larger quantities and need to be transformed in to smaller units by the body (carbohydrates, lipids and proteins)
- **Micronutrients:** nutrients required in smaller quantities by the body (vitamins and minerals)
- **Nutritional Assessment:**interpretation of the anthropometric, biochemical, clinical and dietary data in order to determine whether a person is well nourished or malnourished
- **Malnutrition:** pathological state resulting from a relative or absolute deficiency or excess of one or more essential nutrients (primary vs. secondary malnutrition)
- **Under-nutrition:** pathological state resulting from the consumption of an inadequate quality/quantity of food over an extended period of time
- **Over-nutrition:** pathological state resulting from the consumption of an excess quantity of food over an extended period of time
- **Specific deficiency:** pathological state resulting from a relative/absolute deficiency of an individual nutrient

Self check-1	Written test

Name: _____Date: _____

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

Define the following questions each question has one points

1. Define nutrition
2. Define diet
3. What is malnutrition

Note: Satisfactory rating – 1.5 points Unsatisfactory – below 1.5 points

Answer sheet

Name: _____Date: _____

1. ----------
2. ----------

Information shet 2-Classification of nutrients

2.1 Classifications of nutrients

Based on the amount of the nutrients that each person needs to consume on a daily basis, these nutrients are categorized into two main groups. These are macronutrients, which should be consumed in fairly large amounts, and micronutrients, which are only required in small amounts.

2.1.1 Macronutrients

- 'Macro' means large; as their name suggests these are nutrients which people need to eat regularly and in a fairly large amount.
- They include carbohydrates, fats, proteins, fibre and water. These substances are needed for the supply of energy and growth, for **metabolism** and other body functions.
- Metabolism means the process involved in the generation of energy and all the 'building blocks' required to maintain the body and its functions.
- Macronutrients provide a lot of calories but the amount of calories provided varies, depending on the food source. For example, each gram of carbohydrate or protein provides four calories, while fat provides nine calories for each gram.

2.1.2 Micronutrients

As their name indicates ('micro' means small) **micronutrients** are substances which people need in their diet in only small amounts.These include minerals and vitamins. Although most foods are mixtures of nutrients, many of them contain a lot of one nutrient and a little of the other nutrients.
Foods are often grouped according to the nutrient that they contain in abundance

Nutrient types and their names

- Foods that contain a lot of protein are called body-building foods or **growing foods**.
- Foods that contain a lot of fat or Carbohydrates and perhaps only a little protein are called **energy-giving foods**.
- Foods in which the most important nutrients are vitamins or minerals are called **protective foods**.

What are some of the common foods consumed in your community? Make a list in your Study Diary.

You might have included some of the following in your list; 'injera', maize, 'kocho', bread, porridge ('genfo'), egg, meat, butter, 'shiro', 'kitta', milk, cheese, yogurt, different types of fruits, sugar cane, cabbage, lettuce, lentils,nuts, beans, fish, chicken, fish, oils, and breast milk.

- If people are to stay healthy they must eat a mixed diet of different foods which contain the right amount of nutrients.

Macronutrients in detail

You are now going to look at the different macronutrients in detail.

Carbohydrate

Carbohydrates are referred to as energy-giving foods.

- They provide energy in the form of calories that the body needs to be able to work, and to support other functions.
- Carbohydrates are needed in large amounts by the body. Indeed, up to 65% of our energy comes from carbohydrates.
- They are the body's main source of fuel because they are easily converted into energy. This energy is usually in the form of glucose, which all tissues and cells in our bodies readily use.
- For the brain, kidneys, central nervous system and muscles to function properly, they need carbohydrates. These carbohydrates are usually stored in the muscles and the liver, where they are later used for energy.

Proteins

- About 10–35% of calories should come from protein.
- **Proteins** are needed in our diets for growth (especially important for children, teens and pregnant women) and to improve immune functions.
- They also play an important role in making essential hormones and enzymes, in tissue repair, preserving lean muscle mass, and supplying energy in times when carbohydrates are not available.
- Pregnant women need protein to build their bodies and that of the babies and placentas, to make extra blood and for fat storage.
- Breastfeeding mothers need protein to make breast milk.

Fats and oils

- Fats and oils are concentrated sources of energy and so are important nutrients for young children who need a lot of energy-rich food.
- Fats can also make meals more tasty and satisfying.

Classification of fats

Fats are classified into saturated and unsaturated fats. The classification is important to enable you to advise your community about which fats can be consumed with less risk to people's health. Saturated fats are not good for a person's health. **Saturated fats** are usually solid at cool temperatures. Eating too much saturated fat is not good for a person's health, as it can cause heart and blood vessel problems. **Unsaturated fats** are usually liquid at room temperature. These types of fats are healthy fats. Examples include fats from fish, oil seeds (sesame and sunflower), maize oil and ground nut oil and breast milk.

As a general rule, plant sources of fats are better for a person's health than the animal sources, because animal fats contain more saturated fats. Cooking oils, butter, meat, chicken, fish, ground nut oils and breastmilk are among the sources of fats. Butter, meat fats and oils from animal sources are not good fats, because they have a high amount of saturated fats.

Water

About half of the adult body weight is water 55% for man and 47% for woman. About 2000 to 2500 cc of water is eliminated every day from the body carrying waste products with it. The lost water has to be replaced in the form of fluid or foods containing water. *ƒ* Although some water is formed, as end products of food metabolism, from 6 to 8 glass of water should be drunk every day, People can live without solid food for a few weeks, but we cannot live without water for more than a few days. An adult needs about 2–3 liters of water each day. That is why giving drinks are so important when people lose a lot of water, such as when they have diarrhea.

Importance of water

- Water, next to oxygen is the body's most urgent need.
- It is more essential than food.
- Without water, nutrients are of no value to the body.
- Failure to understand the role of body water contributes to health problems such as indigestion and constipations and even to needless death.
- Infant and children have a greater proportion of water than old persons, and obese persons have proportionately less water than lean persons, Water is taken in the form of water itself, beverages, such as coffee, tea, fruit juices, and milk; and soups, Solid foods contribute the next largest amount of water, as much as 25% to 50% of water requirements,
- Fresh vegetables and fruits are 80% to 90% water; meat is 50% to 60% water, and even bread is about 35% water,
- The sensation of thirst usually is a reliable guide to water intake. Except in infants and sick persons, especially comatose person who cannot respond to the thirst stimulus.
- If losses are not replenished, heat exhausting and possibility heat stroke may occur.
- Dehydration can occur rapidly in comatose patients and in disabled or elderly persons with brain impairment that are unable to respond to the sensation of thirst.

- Other conditions, such as fever, diabetes mellitus, vomiting, diarrhea, and the use of drugs such as diuretics also increase water need.

Fibre

- Fibre is a mixture of different carbohydrates which are not digested like other nutrients but pass through the gut nearly unchanged. Foods rich in fibre are ‘kocho’; vegetables like cabbage, ‘kosta’, carrots, cassava; fruits like banana and avocado; peas and beans; whole-grain cereals like wheat flour and refined maize or sorghum.
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Including fibre in the diet

Fibre should be included in the diet for the following reasons: Fibre makes food bulky or bigger — this can help a person who is overweight to eat less food.Fibre makes the faeces soft and bulky; this can help prevent constipation. Fibre slows the absorption of nutrients, so it helps nutrients to enter the blood stream slowly. This is important for patients with diabetes mellitus. In this section you have learned about the macronutrients: carbohydrates, fats, proteins, water and fibre, and how they nourish the body. You are now going to learn more about vitamins and minerals, the important micronutrients.

Micronutrients in detail

Vitamins

Vitamins are groups of related substances present in small amounts in foodstuffs and are necessary for the body to function normally. Vitamins are also called protective foods. They are grouped together because, as their name implies, they are a vital factor in the diet.Table 2 overleaf sets out the functions of some of the important vitamins and examples of sources of food for each of these.

Table 2 Functions and sources of vitamins.

Vitamins	Function	Food sources
Vitamin A	Night vision Healing **epithelial** cells Normal development of teeth and bones	Breast milk, tomatoes, cabbage, lettuce, pumpkins Mangoes, papaya, carrots Liver, kidney, egg yolk, milk, butter, cheese cream
Vitamin D	Needed for absorption of calcium from small intestines **Calcification** of the skeleton	Ultra violet light from the sun Eggs, butter, fish Fortified oils, fats and cereals
Vitamin K	For blood clotting	Green leafy vegetables Fruits, cereals, meat, dairy products
B complex	Metabolism of carbohydrates, proteins and fats	Milk, egg yolk, liver, kidney and heart Whole grain cereals, meat, whole bread, fish, bananas
Vitamin C	Prevention of **scurvy** Aiding wound healing Assisting absorption of iron	Fresh fruits (oranges, banana, mango, grapefruits, lemons, potatoes) and vegetables (cabbage, carrots, pepper, tomatoes) Breast milk

Epithelial refers to a cells form the thin layer of tissue lining the gut, respiratory and genitourinary systems.

Calcification refers to the hardening of bones by calcium deposits.

Scurvy is a disease caused by vitamin C deficiency which leads to sore skin, bleeding gums and internal bleeding.

Minerals

Minerals are the substances that people need to ensure the health and correct working of their soft tissues, fluids and their skeleton. Examples of minerals include calcium, iron, iodine, fluorine, phosphorus, potassium, zinc, selenium, and sodium.

- ✓ Fruits and vegetables are the main sources of micronutrients.
- ✓ Animal foods also have micronutrients. The vitamins and minerals that make up micronutrients have a crucial role in enabling the body to function properly.
- ✓ Your role as a Health professionalPractitioner is to advise people in your community to have a balanced diet that includes micronutrients.

Self check-2	Written Test

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

I-Essay: Explain briefly: 4% score

1. List type of macronutrients
2. Which type of foods are sources of fats?
3. Which type of fats are not healthy fats?
4. what are the basic classification of nutrients

Note: Satisfactory rating – 2 points Unsatisfactory – below 2 points

Answer Sheet

Score = _____
Rating: _____

Name: _____Date: _____

I- Essay:

1._____

2,_____

3,_____

4,_____

Information shet 3-Nutritional guideline

3.1 Nutritional guideline

A Nutrition guide is a reference that provides nutrition advice for general health, typically by dividing food in food groups and recommending servings of each group. Nutrition guides can be presented in written or visual form,Nutrition guides are published by government agencies, health associations and university health departments. **This nutrition guideline is presented in 3 parts**

- Nutrition strategies in emergency situations
- Rapid nutrition surveys
- Selective feeding programs

3.1.1 Nutrition Strategies in Emergency Situations

a) Food crises

In emergency situations, food security is often severely threatened causing increased risk of Malnutrition, disease and death. Emergency health workers/organizations have the responsibility to try to cure the. Malnourished, prevent malnutrition amongst the vulnerable and promote adequate distribution of food to allow a healthy existence. The complexity of food and nutrition as an issue means that the best response to a situation Depends on the context.

Malnutrition, food insecurity and famine

- Household <<food security>> is a concept that refers to the ability of a household to feed its members, enabling them to live full and active lives.
- Inadequate household food security for a population, on short or long term basis may lead to different forms of chronic and or acute malnutrition.
- While malnutrition is a disease of the individual, the causes of malnutrition are often complex and multi-sectoral, and are linked to different social and economic factors.
- Action to improve household food security (improve availability and access to food) may
- Need to cover a broad range of sectors (agricultural, land ownership, price supports, inflation, taxation, etc.).
- In emergency contexts, there is often a sudden and massive reduction in food availability (drought, conflict, isolation, siege, transport problems) or reduction

in food accessibility some sections of the community (displacement, reduced purchasing power, increased prices).

- The result is often acute and severe food insecurity, which may lead to high levels of malnutrition and mortality.
- In acute food crises the extent of global acute malnutrition means that nutrition becomes an emergency health issue.
- However, even in emergencies, nutrition and food accessibility is a complex social issue and population groups may involve complex coping strategies to deal with reduced availability/access to food.
- A complete breakdown in food security systems leads to acute food shortages which may lead to famine (a time of destitution and increased mortality).

The process of food shortage leading to famine has been described in different phases:

i. Change of behaviour to cope with hard times (rationing of food, sale of excess cattle, etc.).

ii. Sale of capital and income earning assets - which means future prospects are damaged (loans, sale of essential tools, land or cattle).

iii. Break down of established life patterns and destitution (distress migrations, reliance on aid, etc.).

iv. Starvation and death - famine.

Emergency food interventions

- Under emergency conditions, **General Food Distributions** (GFD) aim to bring the nutritional value of the diet, for the whole population, up to a "sufficient" level for survival.
- GFDs are often insufficient to meet the needs of all members of the population and/or distribution of food is unfair, so that certain vulnerable groups (growing children, pregnanat and lactating women, elderly, handicapped) are at particular risk of becoming malnourished.
- Different types of selective feeding programs aim to cover special needs of certain vulnerable groups:

- ✓ **Blanket supplementary feeding** provides a quality or energy supplement in addition to the normal ration which is distributed to all members of identified vulnerable groups to reduce risk (preventive).
- ✓ **Targeted supplementary feeding** provides energy or quality dietary supplements and basic health screening to those that are already moderately malnourished to prevent them from becoming severely malnourished and improve their nutritional status (curative).
- ✓ **Therapeutic feeding** provides a carefully balanced and intensively managed dietary regimen with intensive medical attention, to rehabilitate the severely malnourished (curative) and reduce excess mortality.

B. Assessment of the nutritional situation

Information collected in order to take a decision, and to implement, alter, or stop programmes must be as clear and precise as possible.

General information:

- Identify the origin of the problem (harvest failure, increased prices, and population movements).
- Identify the population that is effected (number, ethnic groups, displaced, villages, and camps).
- Identify other factors that may alter needs for intervention (other organizations, timing of harvests, national strategies).
- Realize the logistic constraints.

Basic health information to be gathered must include:

- Mortality rates (crude and under five mortality rates).
- Major infectious diseases (measles, diarrhoea).
- Nutritional status of the people.
- Water availability (number of litres/person/day).
- Number of persons per latrine.
- Shelter.
- Amount of food available (Kcal/person/day).

Measuring Malnutrition

There are 3 major clinical forms of severe protein energy malnutrition

- ✓ Marasmus,
- ✓ kwashiorkor and
- ✓ Marasmic kwashiorkor.

There are various clinical signs useful for diagnosis, but most obviously a **marasmic** child is extremely **emaciated** and a child with **kwashiorkor** has bilateral **edema.**

However, clinical assessment is not practical for managing nutritional programs and monitoring and comparing large scale food crises.

Most standardized indicators of malnutrition in children are based on measurements of the body to see if growth has been adequate.

- **Height for age (H/A),** is an indicator of chronic malnutrition. A child exposed to inadequate nutrition for a long period of time will have a reduced growth – and therefore a lower height compared to other children of the same age (stunting).
- **Weight for age (W/A**), is a composite indicator of both long-term malnutrition (deficit in height/"stunting") and current malnutrition (deficit in weight/ "wasting").
- **Weight for height (W/H**), is an indicator of acute malnutrition that tells us if a child is too thin for a given height (wasting). For all 3 indicators (W/H, W/A, H/A), we compare individual measurements to international reference values for a healthy population (NCHS/WHO/CDC reference values).
- In emergencies, W/H is the best indicator as:
  - ✓ It reflects the present situation;

- ✓ It is sensitive to rapid changes (problems and recovery);
- ✓ It is a good predictor of immediate mortality risk;
- ✓ It can be used to monitor the evolution of the nutritional status of the population.

- Bilateral oedema is an indicator of Kwashiorkor.
- All children with oedema are regarded as being severely acutely malnourished, irrespective of their W/H. Therefore, it is essential to assess W/H and the presence of bilateral oedema to define acute malnutrition.
- Middle upper arm circumference (MUAC), is another anthropometric indicator.
- MUAC is simple, fast and is a good predictor of immediate risk of death, and can be used to measures acute malnutrition from 6-59 months (although it overestimates rates in the 6-12 month age groups).
- However, the risk of measurement error is very high, therefore MUAC is only used for quick screening and rapid assessments of the nutritional situation of the population to determine the need for a proper W/H random survey.

Measuring the Nutritional Status of a Population

- Anthropometric surveys allow us to quantify the severity of the nutritional situation at one point in time, which is essential to help plan and initiate an appropriate response.
- The prevalence of malnutrition in the 6-59 month age group is used as an indicator fornutritional status of the entire population, because:
  - ✓ This sub-group is more sensitive to nutritional stress,
  - ✓ Interventions are usually targeted to this group.
- During the survey, the nutritional status of individual children is assessed, prevalence of malnutrition is then expressed as the percentage of children moderately and severely acutelymalnourished.
- It is very important to mention:
  - ✓ The indicator (W/H, OEDEMA, MUAC),
  - ✓ The method of statistical description (% of the Median, Z-Score),
  - ✓ The cut-off points used.

- Results should always be expressed as the percentage of children < -2 Z- Scores and < -3 Z Scores and/or oedema, to allow international comparisons as well as for statistical reasons.
- However, it might also be necessary to express the results using a different classification system, if that is the method generally used in the area that you are working in.

Table 3. The cut-off points most often used to define acute malnutrition for the different indicators during nutritional emergencies are:

NUTRITIONAL STATUS	W/H Z SCORE	W/H % of MEDIAN	MUAC
Moderate Acute Malnutrition	between -3 and < -2	between 70% and < 80%	between 110mm and < 125mm
Severe Acute Malnutrition	< -3 or oedema	< 70% or oedema	< 110mm or oedema
GLOBAL ACUTE MALNUTRITION	< -2 or oedema	< 80% or oedema	< 125mm or oedema

* Results expressed by different methods are not directly comparable.

C. Interventions: ensuring adequate general food availability and accessibility

Meeting basic food needs for all

In certain emergency situations the self-reliance of the population is reduced to such an extent that they may become totally dependent on the international community for their livelihood.The classical intervention to meet basic food needs of refugees, the displaced and destitute isa General Food Distribution (GFD). Emergency health organizations prefer to concentrate on their areas of expertise and leave GFD to organizations with more specific experience. In international refugee camps, UNHCR and WFP will agree on their responsibilities to ensure the food supply to the affected population. WFP will supply the basic commodities of the general food ration and the funds for transport and handling of this commodities.UNHCR should provide refugees with complementary food items where necessary: freshvegetables, fish or meat, spices. UNHCR also co ordinates the transport and distribution of the food, which may be sub-contracted to

other agencies. UNHCR will also often takeresponsibility for the supply of food items to supplementary feeding programs.

Quantity of general food rations

- It is impossible to tailor the food basket to individual needs - so an average general ration hasbeen proposed, designed to meet minimum nutritional needs.
- Different guidelines exist between different agencies defining what level of ration is "adequate":
    - ✓ WFP: minimum of 1,900Kcal/person/day
    - ✓ ICRC: 2,400Kcal/person/day.
    - ✓ MSF: 2,100Kcal/person/day
- Although WFP and UNHCR are currently working on new guidelines for a more accurate assessment of population food needs and will not work with a set target ration in the future.
- The overall ration (average Nº KCals) received is not the only factor of importance – food must be provided regularly to ensure a constant flow of food to families to avoid hunger andmust be of sufficient quality (protein, fats, minerals and vitamins) to promote a healthy existence.
- Most health organizations believe that the 1900Kcal/person/day ration is insufficient (whenthere are no other sources of food).
- Generally speaking, the minimum ration should aim to provide 2100Kcal/ person/day (ofwhich, at least 10% of energy should be from protein and 10% from fat).
- The provision of an adequate food ration has been clearly shown to have a critically important effect on the recovery and maintenance of a satisfactory health status in camp populations).
- The classic full food basket contains 6 basic commodities; a cereal, a pulse, oil/fat, possibly a fortified cereal blend, sugar and salt and occasionally may include some canned fish or meat.

Table 4 shows examples of recommended ration

Commodity	Recommended ration (g/person/day)
Cereal : maize	400
Pulse : beans	60
Oil/Fat : vegetable oil	25
Fortified Cereal Blend : corn soya blend	100
Sugar	15
Salt	5
Kcals	2261Kcals
Protein (* = g, ** = % KCals)	* 71.2g, **12.6%
Fat (* = g, ** = % KCals)	* 47.9g, **19.1%

Factors that require an increase in the general ration

- Age and sex composition of the population: an excess of male adults or pregnant women calls for higher rations per capita.
- Bad general health and nutrition status: widespread illness, epidemics, general undernutrition or a crude mortality rate >1/10,000/day, implies the need for anincreased ration.
- Activity level: during periods of increased activity (intense agricultural labour, specific infrastructure works or other labour intensive activities - pounding/milling cereals supplied, fetching water and firewood from great distances), the energy component of the ration should be increased.
- Low temperatures: a drop in temperature will increase metabolic energy expenditure

Quality of the general food ration

Ration composition is often calculated with insufficient attention paid to the nutrient content. Consequently, refugees and displaced often suffer from micronutrient deficiencies. Complementary food items, supplied with the basic ration, may not contribute significantly to overall energy intake, but are often crucial for increasing the acceptability, palatability and quality of the food ration (i.e. protein, micronutrients). Unfortunately, food basket commodities and ration levels are often determined by what surpluses donor governmentswish to dispose of. Due to the donor driven supply of food aid and the logistical difficulties with food distributions, food baskets seldom contain 6

items and are rarely upto standards in terms of energy content, micronutrient content or acceptability.The risk of specific nutrient deficiencies can be estimated from the composition of the general food ration. The following table gives you some clues as to which deficiencies might be expected according to the composition of the food ration

Table 5 expected deficiencies to the composition of the food ration

Commodity	Risk	Possible Solutions
Maize	Pellagra (Vitamin B3 (Niacin) or a low protein diet with no tryptophan)	- Nuts, beans, wholegrain cereals - Meat, fish, eggs, milk - Fortification
Polished rice	Beri-beri (Vitamin B1 (Thiamine) deficiency)	- Parboiled rice/whole grains - Groundnut, legumes - Meat, fish, milk, eggs - Fortification
No fresh fruits or veg	Scurvy (Vitamin C deficiency)	- Onions - Canned tomatoe paste - Vitamin C tablets
	Night blindness and xerophthalmia (Vitamin A deficiency)	- Green leaves and bright colored veg/fruits - Butter or red palm oil - Vitamin A capsules
	Anaemia (Iron deficiency)	- Greens - Meat/fish - Iron/folic acid supplementation - Fortification

The role of health organizations

In the absence of an adequate general ration, selective feeding programs and other dietary supplementation will have limited or zero impact. The relevance and effectiveness of specific feeding programmes should always be evaluated as complementary to an adequate general food ration. It is the duty and responsibility of emergency health organizations to monitor the regularity and adequacy of the general food ration supplied to the beneficiaries. As emergency health organizations are often the only operatives with a full time field presence, they may be the only witnesses available. The general health and nutrition status of the population in need and the impact of selective feeding programmes depend on it. Monitoring implies an active collection of relevant data, and targeted reporting of information to the authorities and agencies concerned to influence distribution activities as needed.

Food System Monitoring

It is crucial to have information on the actual amount and quality of food that reaches thefamily or beneficiary. There can be substantial differences between what is actually received per capita and the theoretical general food ration (GFR). Furthermore, there may be considerable variation in the levels of access to food rations by individuals between/within populations.

D. Interventions: selective feeding programmes

Even if the overall food needs of a population are adequately met there may be inequities inthe distribution system, disease and other social factors causing degrees of malnutrition in certain vulnerable groups. Vulnerable groups may be targeted to receive a food supplementin order to upgrade their diet to a level that responds to their increased needs. Those that are already acutely malnourished must receive medical and nutritional attention in order to rehabilitate them to a healthy state.

Objectives of selective feeding programmes

The general objective of a therapeutic feeding programme (TFP) is to reduce mortality by taking care of those vulnerable groups at greatest risk of dying from causes related to malnutrition. Generally the target group is children less than 5 years with severe acute malnutrition. The general objective of a targeted supplementary feeding programme (SFP) is to prevent the moderately malnourished becoming severely malnourished and thereby reduce the prevalence of severe acute malnutrition and associated mortality. Other factors like general food supply, water and sanitation and general health services also have a major impact on the pattern of mortality, disease and malnutrition. Objectives of feeding programmes should be specified to be realistic and feasible, and must therefore take into account the local conditions and project capacity.

E. Evaluation

The collection of information for monitoring and evaluation should be an integral part of all nutrition programmes. Evaluation is a learning process involving continuous collection of information to monitor the progress in achieving set goals and to suggest adaptations to the progamme, or closure with time.

Monitoring and evaluation will involve the planned and regular collection and analysis of:

- PROCESS INDICATORS to evaluate the progress in implementation and the trends in programme needs over time (i.e. attendance rates, coverage, recovery rates).
- IMPACT INDICATORS to evaluate the effect the programme is having/had on the population, and to summarize the total efficacy of the programme (malnutrition prevalence, mortality figures, numbers served).

Assessment of impact is extremely difficult as analysis of trends in health indicators does not prove that the programme has caused the change. However, a well collected data set can be used to argue for an association of the programme with the change in overall health status. It makes little sense to only look at indicators of IMPACT for evaluating a nutritional programme. First it is necessary to know that the programme serves a useful purpose and is running well. PROCESS information will allow you to see how well the programme is functioning and adapt programme emphasis and design over time. PROCESS Indicators should be thoroughly analyzed and interpreted.

Self check-3	Written test

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

I-Essay: Explain briefly: 4% score

1. What is Anthropometry?
2. List the three parts of nutrition guidelines

Note: Satisfactory rating – 2 points Unsatisfactory – below 2 points

Answer Sheet

Score = _____
Rating: _____

Name: _____Date: _____

I- Essay:

1._____

2,_____

Information shet-4-Describing elements of food

4.1 Components of Nutrition

Carbohydrates

Carbohydrates are necessary to supply your body with glucose, which is its primary source of energy. They are generally divided in two categories: simple carbohydrates, which digest quickly, and complex carbohydrates, which digest slowly. Sources of simple carbohydrates include:- fruits, sugars and processed grains, such as white rice or flour. You can find complex carbohydrates in green or starchy vegetables, whole grains, beans and lentils. MayoClinic.com recommends around 225 grams of carbohydrates daily for healthy adults. Dietary fiber is another form of carbohydrate required for proper digestion. Women need 22 to 28 grams of fiber daily and men need 28 to 34 grams. Dietary fiber bulks your stool and keeps you feeling full for hours after a meal.

Protein

Protein is required for healthy muscles, skin and hair. In addition, it contributes to normal chemical reactions within your body. Complete sources of protein, primarily meats, contain the nine amino acids essential for human health. If you do not eat meat, combining incomplete proteins -- such as rice and beans provides your body with the nine essential amino acids. Average adults need 50 grams of protein daily.

Fats

Despite the belief that fats are bad for you, they are required for general health. Fats help your body synthesize fat-soluble vitamins, such as vitamin D. Healthy fats include monounsaturated and polyunsaturated. Nuts, olives and avocados are sources of monounsaturated fats. Fish and seafood are primary sources of polyunsaturated fats. In addition, vegetable oils, such as canola, contain both monounsaturated and polyunsaturated fats. Certain types of fats are bad for your health, however, such as trans-fat and saturated fat, both of which increase your risk of heart disease. You should limit your intake of saturated fat to 16 grams daily and avoid trans-fats completely. MayoClinic.com recommends at least 44 grams of fat daily for average adults.

Vitamins

Many vitamins are essential for health and thus considered primary components of nutrition. Essential vitamins include vitamins A, B complex, C, D, E, K and foliate. A vitamin deficiency can cause osteoporosis, scurvy, a weakened immune system, premature aging and even certain cancers. Many fruits and vegetables have high vitamin content, as well as fortified dairy and bread products.

Minerals

Minerals are vital for proper human health. Essential minerals include; calcium, iron, zinc, iodine and chromium. Deficiencies can result in serious health conditions such as brittle bones and poor blood oxygenation. Like vitamins, overdosing on minerals can result in life threatening conditions -- for example, a potassium overdose can cause improper kidney function. Minerals are found in a variety of foods including dairy and meat products.

Water

The human body is composed of 60 percent water and your brain is composed of 70 percent water. Water is necessary to maintain proper bodily function. Most people should aim for eight to ten 8-ounce glasses of water daily. It is possible to overdose on water, and in severe cases, a water overdose can be fatal.

4.2 Source elements of food

- **Sources of carbohydrates**
  - ✓ The main sources of carbohydrates are bread, wheat, potatoes of all kinds, maize, rice, cassava, ‘shiro’, pasta, macaroni, ‘kocho’ ,banana, sweets, sugar cane, sweet fruits, and honey.
  - ✓ Other foods like vegetables, beans, nuts and seeds contain carbohydrates, but in lesser amounts.
- **Sources of protein**
  - ✓ Animal Sources: e.g. meat, egg, poultry, milk, fish
  - ✓ Plant Sources: e.g. cereals and legumes

- ✓ The main sources of proteins are meats, chicken, eggs, breast milk, beans, ground nuts, lentils, fish, cheese and milk.
- ✓ All animal foods contain more protein than plants and are therefore usually better sources of body building foods.
- ✓ However, even though plant proteins are usually not as good for body-building as animal proteins, they can become more effective nutritionally when both are mixed with each other.

- **Sources of fat and oil**
  - ✓ Fat is found in meat, chicken, milk products, butters, creams, avocado, cooking oils and fats, cheese, fish and ground nuts.

- **Sources of fibre**
  - ✓ Foods rich in fibre are ‘kocho’; vegetables like cabbage, ‘kosta’, carrots, cassava; fruits like banana and avocado; peas and beans; whole-grain cereals like wheat flour and refined maize or sorghum.

- **Sources of vitamins C**
  - ✓ Fresh fruits (oranges, banana, mango, grapefruits, lemons,potatoes) and vegetables (cabbage, carrots, pepper, tomatoes) Breast milk

- **sources of common minerals.**
  - ✓ **Calcium;** Milk, cheese and dairy products, Foods fortified with calcium, e.g. flour, cereals. Eggs, fish cabbage
  - ✓ **Iron;** Meat and meat products, Eggs, bread, green leafy vegetables, pulses, fruits
  - ✓ **Iodine;** Iodised salt, sea vegetables, yogurt, cow's milk, eggs, and cheese Fish; Plants grown in iodine-rich soil
  - ✓ **Zinc;** Maize, fish, breastmilk, meat, beans
  - ✓ **Fluorine;** Wate

4.3 Classification elements of food

Classification of carbohydrates

I. Monosaccharides:

- Contain one CHO molecule and are called sugars
- Are water soluble
- Have crystalline structure and sweet taste.
- All have the same suffix-ose Examples: glucose, fructose and galactose

II. **Disaccharides**:

- Have similar characteristics with monosaccharides, but they have two sugar molecules

  Examples: sucrose, lactose and maltose

III. Polysaccharides/complex CHO/

- Insoluble in water
- Do not form crystals
- Don't taste sweet
- Have no characteristic suffix
- Composed of many glucose molecules
- Some of them can't be digested by human GI tract Examples: glycogen, starch, cellulose

Classification of Proteins

I. **Based on chemical composition**

- **Simple protein:** yield amino acids upon complete hydrolysis E.g. albumin in eggs, zein of corn
- **Compound/conjugated proteins:** protein + non-protein E.g. Hgb (protein + hem) in blood, Mucin (protein + CHO) in saliva

II. Based on nutritional value

- **Complete proteins:** contain all the essential amino acids

  E.g. almost all animal proteins, except gelatin

- **Incomplete proteins:** at least one essential amino acid is missed

  E.g. proteins of plant origin, except soya bean
- A **complementary protein:** is one that supply the deficient of essential amino acid in another protein. E.g. legumes (best in lysine but lack methionin) can compliment cereals (high in methionine but lack lysine)

III. Based on Conformation (shape) of the Protein:

- **Globular proteins:** tightly folded ploy-peptide chain (spherical or globular shape) and mostly soluble in water & salt solution. E.g. Enzymes, antibodies, many hormones, Hgb
- **Fibrous proteins:** polypeptide chains arranged in parallel manner along an axis. They are tough & insoluble in water. E.g. Collagen of tendons & bone matrix, keratin of hair, skin & nails, and elastin of blood vessels

Classification of fats

- Fats are classified into saturated and unsaturated fats.
- The classification is important to enable you to advise your community about which fats can be consumed with less risk to people's health.
- Saturated fats are not good for a person's health.
- **Saturated fats** are usually solid at cool temperatures. Eating too much saturated fat is not good for a person's health, as it can cause heart and blood vessel problems.
- **Unsaturated fats** are usually liquid at room temperature. These types of fats are healthy fats. Examples include fats from fish, oil seeds (sesame and sunflower), maize oil and ground nut oil and breast milk.

Classifications of vitamins

Vitamins are classified into two groups:

- **Fat soluble vitamins** (vitamins A, D, E and K) are soluble in fats and fat solvents. They are insoluble in water. So these are utilized only if there is enough fat in the body.
- **Water soluble vitamins** (vitamins B and C, and folic acid) are soluble in water and so they cannot be stored in the body.

4.4 Composition and function elements of food

- **Functions of Carbohydrates**
  - ✓ Energy supply
  - ✓ Protein-sparing action
  - ✓ Helping the body use fat efficiently
  - ✓ Lactose enhances calcium absorption
  - ✓ As component of body substances and compounds
  - ✓ Encouraging growth of useful bacteria
  - ✓ Promoting normal functioning of the lower intestine
  - ✓ Improving the palatability of food/drink
  - ✓ Texture and preservative

- **Functions of Proteins**
  - ✓ Building the body and growth of new tissue
  - ✓ Maintenance of existing tissue
  - ✓ Synthesis of enzymes, hormones and antibodies
  - ✓ Fluid movement in the body:- determine the direction of movement of fluids by exerting osmotic pressure. E.g. plasma protein osmotic pressure
  - ✓ Buffer: due to the carboxyl or acid group (-COO) and amino or basic group (- NH_2)
  - ✓ Source of energy (4 kcal/g)

- **Functions of vitamins**

- ✓ **Vitamin A;** Night vision, healing **epithelial** cells, Normal development of teeth and bones
- ✓ **Vitamin D;** Needed for absorption of calcium from small intestines **Calcification** of the skeleton
- ✓ **Vitamin K;** For blood clotting
- ✓ **B complex;** Metabolism of carbohydrates, proteins and fats
- ✓ **Vitamin C;** Prevention of **scurvy,** Aiding wound healing, Assisting absorption of iron

- **Functions of minerals;**
  - ✓ **Calcium;** Gives bones and teeth rigidity and strength
  - ✓ **Iron;** Formation of haemoglobin
  - ✓ **Iodine**; For normal metabolism of cells
  - ✓ **Zinc;** For children to grow and develop normally; for wound healing
  - ✓ **Fluorine;** Helps to keep teeth strong

- **Functions of Water**
  - ✓ Water is a universal media in which all biological chemical reactions take place
  - ✓ As a carrier it aids digestion, absorption, transportation, excretion of nutrients.
  - ✓ It also provides mechanical functions i.e. lubrication of joints, visceral organs, regulates body temperature
  - ✓ It is used for washing to reduce food born diseases and for catering (preparation of food)

Self check-4	Written test

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

I-Essay: Explain briefly: 4% score

1. List some example of Essential minerals.
2. Describe the source of monounsaturated and polyunsaturated fats.
3. What is the use of carbohydrate to our body.
4. What are the function of carbohydrate

Answer Sheet

Score = _____

Rating: _____

Name: _____Date: _____

I- Essay:

1._____

2,_____

3,_____

4,_____

LG#39	**LO#2 Manage nutritional problems and provide dietary service**

Instruction sheet
This learning guide is developed to provide you the necessary information regarding the following content coverage and topics – ▪ Addressing nutritional requirement ▪ Addressing reason for nutritional requirements ▪ Factors affecting nutritional requirements ▪ Balanced diet and factors affecting it ▪ Addressing Nutritional deficiency status in Ethiopia This guide will also assist you to attain the learning outcome stated This guide will also assist you to attain the learning outcome stated. Specifically, upon completion of this Learning Guide, you will be able to – • Describe Factors affecting energy (calorie) requirement • Know reason for nutritional requirements • Describe what Balanced diet means • Identify Nutritional deficiency status in Ethiopia

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information sheet 1-Addressing nutritional requirement

1.1 Addressing nutritional requirement

Nutritional requirement: refers to the amount of nutrients from food that should be ingested (taken) by a healthy individual in a certain group over a range of time and that will protect the individual from developing any deficiency disease. Requirements of nutrients for an individual in a group are estimated by assuming the requirements of individuals within a certain group are normally distributed.The nutrient requirements during the four main stages of the human lifecycle vary considerably. What infants and children require is different from what adults and the elderly need. In addition, there might be specific nutrients which a pregnant women and lactating mothers need in higher amounts than adult men. Therefore, as a Health professional, this study session will help you to give the appropriate messages to different population groups.

Nutrition during pregnancy and lactation

An unborn child needs a healthy and well-nourished mother to grow properly. Therefore, a mother needs to gain weight during pregnancy to help nourish her growing baby. Women who do not gain enough weight often have babies that weigh too little (**low birth weight**). A baby weighing less than 2.5 kg has an increased chance of both physical and mental health problems. It may also suffer more from infection and malnutrition compared with babies of normal weight. **Increased requirements**: energy, protein, essential fatty acids, vitamin A, vitamin C, B vitamins (B1, B2, B3, B5, B6, B12, folate), calcium, phosphorus, iron, zinc, copper and iodine. Women should gain at least 11 kg during pregnancy. If the mother gains less than this, the baby's chances of survival and health declines. If a mother is overweight, she still needs to gain for her baby's health. She should not try to lose weight while she is pregnant.

Gaining weight in pregnancy

- A pregnant mother should gain weight smoothly and steadily.
- If weight gain occurs suddenly, she should see a health professional.
- During the first three months, she should expect to gain a total of 1–2 kg.
- During the last six months, she needs to gain about 0.5 kg each week.
- If she has already gained 11 kg after six–seven months, she should continue to gain moderately until delivery.
- The baby puts most of its weight during the last few months.

Eating during pregnancy

Women's nutrition during pregnancy and lactation should focus on the three micronutrients (vitamin A, iron and iodine) and extra energy intake/reduction of energy expenditure.Therefore the following are essential nutrition actions related to maternal nutrition:

- A pregnant or breastfeeding woman needs extra foods, especially those that are good sources of iron.
- Pregnant women need at least one additional meal (200 Kcal) per day during the pregnancy.
- A pregnant woman needs to cut down her energy expenditure.
- She should reduce her involvement in strenuous household tasks that lead to higher energy expenditure.
- Pregnant women should eat iodized salt in their diet.
- Pregnant women should take vitamin A rich foods (such as papaya, mango, tomato, carrot, and green leafy vegetable) and animal foods (such as fish and liver).
- In the malarias areas, pregnant women should sleep under an insecticide-treated bed net.
- Pregnant women during the third trimester of pregnancy should be de-wormed using mebendazole

- Pregnant women need a well balanced diet containing mixture of foods. This should include as far as possible food from the different food groups (animal products, fruits, vegetables, cereals and legumes).

Preventing anaemia in pregnancy

Some women feel weak and tired when pregnant. They may be anaemic which in turn means that they may have difficulty in pregnancy and childbirth. Common problems linked to the mother's anemia include:

- ✓ Babies will be born without three to six months iron supply
- ✓ Breast milk may have insufficient iron.

- A pregnant or breastfeeding mother should have enough iron to keep herself and her baby healthy.
- She should eat plenty of iron rich. Foods every day such as dried beans, legumes, dark green leafy vegetables, liver, kidney and heart.
- A pregnant mother should go for her first antenatal care visit at the latest by the fourth month of her pregnancy. At the clinic,
- Check her urine for excess sugar and proteins, and her blood for malaria (if she is showing signs of infection).
- You diagnose anaemia in the following way:
  - ✓ Examine the lower eyelids, the inside of the lips and the palms which should be bright pink; if there is anaemia, all of these will be pale whitish.
- Give the mother iron tablets or tablets with iron and folate to build strong blood
- Remind the mother to take the tablets after a main meal. She should not take iron tablets with tea, coffee or milk
- If the iron tablets upset the mother or cause side effects, she should not stop taking iron, but eat more leafy vegetables.

Pregnant women with special needs

Some pregnant women in your community will be particularly vulnerable. As a health professional it is important that you identify the women who may need extra help and support. From you and outlines the kinds of service you can provide for them.

Nutrition during lactation (breastfeeding)

When a baby sucks at the nipple, this causes the milk to come into the breast and continue to flow. Breast milk is food produced by the mother's body especially for the baby, and it contains all the nutrients (nourishment) a healthy baby needs. A lactating woman needs at least two extra meals (550 Kcal) of whatever is available at home. In addition a dose of vitamin A (200,000IU) should be given once between delivery and six weeks after delivery. This will enable the baby to get an adequate supply of vitamin A for the first six months. During the first six months the best way of feeding the baby is for the mother to Breastfeed exclusively. Increased requirements: vitamins A, C, E, all B vitamins, and sodium (applies only to individuals under age 18). In addition to extra meals and one high dose of vitamin A, a breastfeeding woman also needs:

- ✓ Iodized salt in her diet
- ✓ At least one liter of water per day
- ✓ Vitamin A rich foods (such as papaya, mango, tomato, carrot and green leafy vegetables) and animal foods (such as fish and liver).

Nutritional requirements during adulthood

The nutritional needs in adults of 19–50 years of age differ slightly according to gender. Males require more of vitamins C, K, B1,B2 and B3, and zinc. Females require more iron, compared with males of similar age. You have already seen that pregnant women and lactating mothers have particular nutrient requirements that are necessary for their own health as well as the health of their baby.

Nutritional requirements during later years

Elderly people are especially vulnerable to nutritional problems due to age related changes in their body (impaired physiological and anatomical capacity). Possible nutritional issues in old age

- ✓ Problems of procuring and preparing foods
- ✓ Psychosocial problems
- ✓ Digestion problems
- ✓ Nutrient absorption problems
- ✓ Renal changes
- ✓ Memory loss (senile dementia), which may include forgetting to eat

- ✓ Sensory changes
- ✓ Physical problems like weakness, gouty arthritis and painful joints.

Specific nutrient requirements in old age

An elderly person requires less energy than a younger individual due to reductions in muscle mass and physical activity. Some daily requirements for elderly people differ from those of younger adults. For example, in order to reduce the risk for age related bone loss and fracture, the requirement for vitamin D is increased from 200 IU/day to 400 in individuals of 51–70 years of age and to 600 IU/day for those over 70 years of age. Suggested iron intakes reduce however from 18 mg per day in women aged 19–50 to 8 mg/day after age 50, due to better iron conservation and decreased losses in postmenopausal women compared with younger women. Some elderly people have difficulty getting adequate nutrition because of age or disease related impairments in chewing, swallowing, digesting and absorbing nutrients. Their nutrient status may also be affected by decreased production of chemicals to digest food (digestive enzymes), changes in the cells of the bowel surface and drug–nutrient interactions. Some elderly people demonstrate selenium deficiency, a mineral important for immune function. Impaired immune function affects susceptibility to infections and tumors (malignancies). Vitamin B6 helps to boost selenium levels, so a higher intake for people aged 51–70 is recommended. Nutritional interventions should first emphasis healthy foods, with supplements playing a secondary role. Although modes supplementary doses of micronutrients can both prevent deficiency and support immune functions, very high dose supplementation (example, high dose zinc) may have the opposite effect and result in immune-suppression. Therefore, elderly people also need special attention with regard to nutritional care.

Self-Check 1	True/false

Name: _____Date: _____

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

I-Essay: Explain briefly:

1. What are the effects of low maternal iron level for the baby and mother in pregnancy?
1. Which parts of the body should you examine to find out whether a pregnant woman is anemic or not?

Answer Sheet

Score = _____

Rating: _____

Name_____Date: _____

I- Essay:

1._____

2. _____ __

_____

Information sheet 2-Addressing reason for nutritional requirements

2.1 Introduction

Nutritional requirement refers to the amount of each nutrient needed. These are different for each nutrient and also vary between individuals and life stages, e.g. women of childbearing age need more iron than men.

You need to know nutritional requirements of an individual or group for two major reasons:

- **Prescriptive reasons:** that is, to provide or dispense food supplies; for example:
  - ✓ To procure food for national consumption
  - ✓ To secure food for institutional consumption
  - ✓ To run nutritional supplementation programs.
- **Diagnostic reasons:** mainly to identify whether a group or an individual is suffering from malnutrition of any kind; for example:
  - ✓ To evaluate nutritional intervention programs
  - ✓ To determine whether the food available in the stock is adequate to feed the household or nation for a certain duration of time.
  - ✓ In order to estimate nutritional requirements of individuals or groups, we need to consider the following factors:
    - Physical activity — whether a person is engaged in heavy physical activity
    - The age and sex of the individual or group
    - Body size and composition — what the general build is of a person or group
    - Climate — whether a person or group is living in hot or cold climate
    - Physiological states, such as pregnancy and lactation.

-

2.2 Factors affecting nutritional requirements

The factors that affect the nutritional requirements of an individual are the quality and Quantity the food they eat, the efficiency of their digestive system in absorbing and utilizing eaten food and biochemical availability. The quality of food that we eat can vary depending on the soil and growing conditions of that food. Soil that has been overworked and chemicals added and also drugs and antibiotics that have been given to livestock and crops to aid growth are all factors that affect nutrition in our food and can affect our own body's biochemistry. Nutritional quality of our food can be affected by the manufacturing process, storage and preparation of our food.

The quantity of food that we eat also influences our nutritional status. In developing countries malnutrition is a huge problem but in developed countries under nutrition can occur due to dependency on heavy refined processed foods.The efficiency of our digestive system affects our nutritional status. Bad condition of our intestines will reduce the absorption of digested foods into our blood stream.

Metabolic faults, sensitivity to certain food and the presence of substances like tea and coffee can affect the absorption rate of certain nutrients. Biochemical availability is the optimum range of intake of a person essential nutritional requirement. This nutritional requirement is influenced by age, growth, sex, pregnancy and breast feeding, illness, psychological and emotional stress, activity level and other factors like smoking and drinking.

Nutritional requirements change as a person gets older, because the elderly use a lot of medication their absorption, excretion and utilization of nutrients can be affected. Growing children have different nutritional needs to that of adults. For instance, a growing infant requires a higher intake of essential fatty acids than that of an adult. In the same way there are different nutrition requirements for young and old there are also very different requirements between the sexes. For example, a woman's nutritional requirements can vary throughout her menstrual cycle, also a woman who is pregnant

or breastfeeding has different nutritional requirement to that of one who is not. Nutritional requirement vary depending on whether someone is healthy or ill. As diseases are unique so are the nutritional requirements needed whilst that person is ill. The same applies to psychological and emotional stress. When people are affected by stress their appetite is affected, this results in less intake of food which in turn results in less nutrients being absorbed. A person activity level will affect their nutritional requirement. An athlete will need a different nutritional requirement to that of an office worker. Exercise improves metabolic efficiency in some people and increases nutrient requirement. People may find that certain nutritional requirements are increase within their family. Genetics can play a part in an extra need for certain nutrients. ther factors such as using recreational drugs, smoking and drinking can affect nutrient requirements. Even beverages like Tea and Coffee can affect nutrient requirements; they both inhibit the absorption of Iron and Zinc.

Self-Check 2	Written test

Name: _____Date: _____

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

I-Essay: Explain briefly:

1. Identify factor that affect nutritional requirements
2. Why we need to know nutritional requirements of an individual or group?

Answer Sheet

Score = _____
Rating: _____

Name:_____Date: _____

I- Essay:

1._____

2. _____

_____

Information sheet 3- Balanced diet and factors affecting it

3.1 Balanced diet and factors affecting it

Balanced diet is a diet that contains an adequate quantity of the nutrients that we require in a day. A balanced diet includes six main nutrients, i.e. Fats, Protein, Carbohydrates, Fiber, Vitamins, and Minerals. All these nutrients are present in the foods that we eat. Different food items have different proportions of nutrients present in them. The requirements of the nutrients depend on the age, gender, and health of a person.

Essential Components and Deficiency Diseases

- Importance of a Balanced Diet
- The following are the importance of a balanced diet :
  - ✓ Balanced Diet leads to a good physical and a good mental health.
  - ✓ It helps in proper growth of the body.
  - ✓ Also, it increases the capacity to work
  - ✓ Balanced diet increases the ability to fight or resist diseases.
  - ✓ Components of a balanced diet
- Some components of a balanced diet are as follows :
- **Fats**; some part of our energy requirement is fulfilled by fats.
- Fats can be found in fatty foods such as butter, ghee, oil, cheese, etc.
- **Proteins**; we need proteins for growth purposes and to repair the wear and tear of the body.
- Protein also helps in building muscle.
- It is found in dairy products, sprouts, meat, eggs, chicken, etc
- Carbohydrates; we need the energy to process and it is fulfilled by carbohydrates.
- Carbohydrates **provide** us energy.
- Carbohydrates can be found in rice, wheat, chapatti, bread, etc. Cereals are our staple food.

- Minerals and Vitamins**;** Vitamins, Minerals, and Fiber improve the body's resistance to disease.
- We mainly obtain it from vegetables and fruits.
- Deficiency diseases like Anemia, Goiter, etc can be caused due to lack of mineral in the body.

Self-Check 3	Written test

Name: _____Date: _____

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

Choose the best answer ; **Write the correct answer on the given space**

1. What is **Balanced diet?**

2. Carbohydrates can be found in

   a. rice c. bread

   b. wheat d. all

Answer Sheet

Score = _____

Rating: _____

Name:_____Date: _____

Choose the best answer:

1. _____

2. _____

Information sheet 4- Addressing Nutritional deficiency status in Ethiopia

4.1 Nutritional deficiency status in Ethiopia

The knowledge acquired will enable you to identify children with malnutrition in your community at the earliest possible stage and to consider strategies you can use to manage the situation effectively **Malnutrition** is a general term that includes many conditions, including under nutrition, over nutrition and micronutrient deficiency diseases (like vitamin A deficiency, iron deficiency anaemia, iodine deficiency disorders and scurvy).

4.2 Types of malnutrition

- **Wasting, or thinness**, is an indicator of acute (short-term) malnutrition. Wasting is usually the result of recent food insecurity, infection or acute illness such as diarrhoea. Measurement of wasting or thinness is often used to assess the severity of an emergency situation, with severe wasting being highly linked with the death of a child.
- **Stunting, or shortness**, is an indicator of chronic (long-term) malnutrition. It's often associated with poor development during childhood and is one of the harmful effects of poverty. Stunting is commonly used as an indicator for development, as it is highly related with poverty.
- **Underweight,** is an indicator of both acute and chronic malnutrition. Underweight is a highly useful indicator when examining nutritional trends.

4.3 Common forms of malnutrition in Ethiopia

- Malnutrition is a major public health problem in many developing countries.
- It is one of the main health problems facing women and children in Ethiopia.
- The country has the second highest rate of malnutrition in Sub-Saharan Africa (SSA).
- Ethiopia faces the four major forms of malnutrition:
  - ✓ acute and
  - ✓ chronic malnutrition,

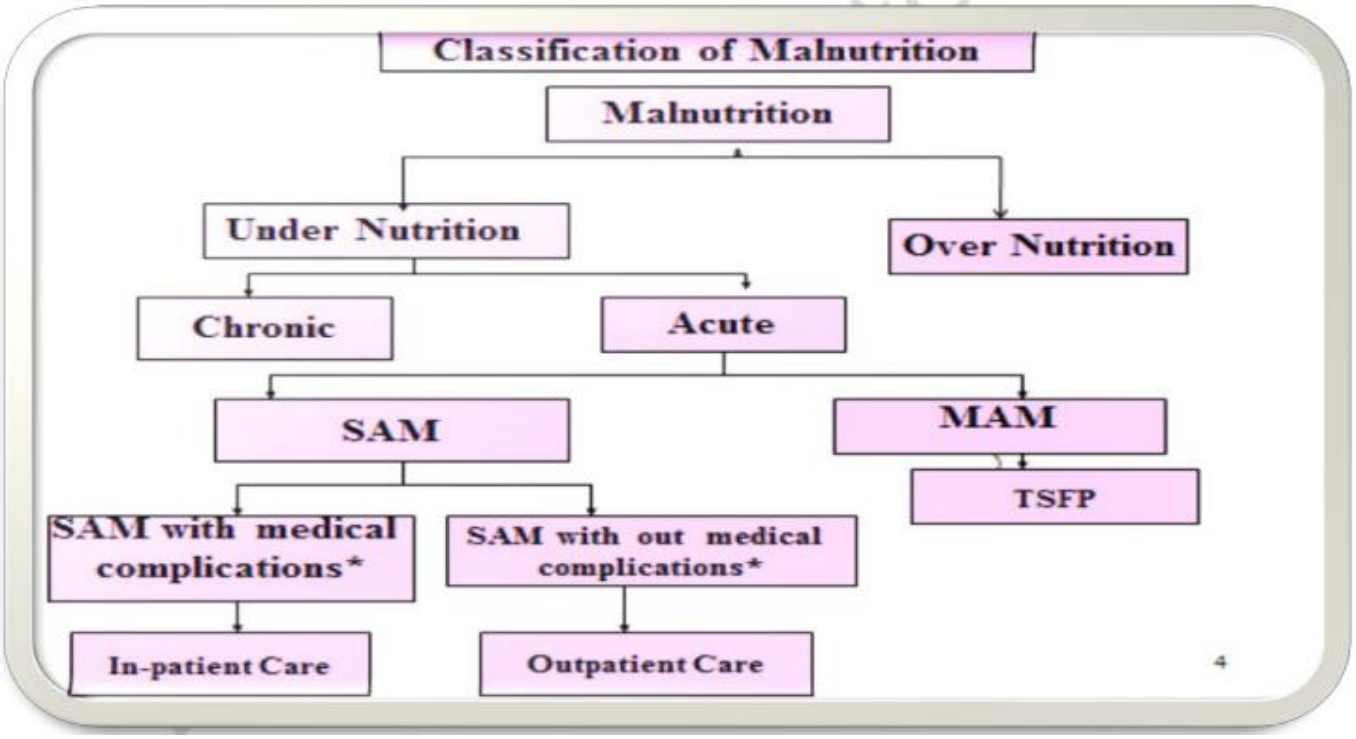
- ✓ iron deficiency anaemia (IDA), vitamin A deficiency (VAD), and
- ✓ Iodine deficiency disorder (IDD).

4.4 Classification of malnutrition

You need to know how to identify acute malnutrition, and to differentiate between severe acute malnutrition and moderate acute malnutrition.

- **Protein-energy-malnutrition (PEM):** A clinical syndrome present in infants and children as a result of deficient intake and/or utilization of food.
  - ✓ **Marasmus**: Severe form of acute malnutrition that is characterized by wasting of body tissues.Marasmic children are extremely thin.
  - ✓ **Kwashiorkor**: Severe form of acute malnutrition characterized by bilateral edema and weight-for-height of greater or equal to -2 SD
  - ✓ **Marasmic-Kwashiorkor**: Severe form of acute malnutrition characterized by bilateral edema and weight-for-height of less than -2 SD.

However there is now a new way of classifying malnutrition so you need to know and should use these terms. With the current classification, all the three forms of severe protein energy malnutrition are now classified as **severe acute malnutrition**.



4.5 Causes of malnutrition

This section looks at possible causes of malnutrition and asks you to consider in particular the level of malnutrition in your community.The causes of malnutrition can be very complex. Malnutrition is influenced by many factors acting at multiple levels. These factors often act in a continuous cycle and include dietary intake issues, diseases, food insecurity, and inadequate maternal and child health care and sanitation services. Illiteracy and poverty may also influence the food intake of people in your community and become causes of malnutrition, because the causes of malnutrition are complex, they should be addressed in a systematic way in order to find the right solutions for the problem. Usually malnutrition is not the single consequence of a single factor but a mixture of different causes. The size of the contribution of each of these may vary The causes of malnutrition have been divided into three main headings:

i. The immediate causes.
ii. The basic causes;
iii. The underlying causes; and

i. Immediate causes of malnutrition

The immediate causes associated with malnutrition include poor diet and disease. **Poor diet**: If a child doesn't get an adequate diet they will become malnourished. The poor diet might be due to not enough food, or a lack of variety of foods in meals; low concentrations of energy and nutrients in meals; infrequent meals; insufficient Breast milk; and early weaning. **Disease**: Diseases, especially infectious diseases, cause undernutrition because a sick Child may not eat or absorb enough nutrients, or may lose nutrients from the body due.To vomiting or diarrhoea, or have increased nutrient needs which are not met.

- ✓ The diseases most likely to cause undernutrition are: measles; diarrhoea; AIDS; respiratory infections; malaria; and intestinal worms.
- ✓ Infection will lead to undernutrition and the undernutrition also leads to infection.

ii. Underlying causes of malnutrition

- Poor diet and disease are the immediate causes of malnutrition for children but it is always important to try to find out why that child has a poor diet or why they have developed the disease.
- The underlying causes differ within different communities and from family to family but it is useful to group them into: family food shortages; inadequate care of children and women;
- Unhealthy environment and poor health services; and too many children in a family to feed. For each underlying cause you identify, there is probably another, 'deeper' cause. For example, a child may have a poor diet because the family has little food. But, why is the family short of food? Perhaps they have too little land or a low income. But why have they too little land? Keep probing and asking 'But why?' Eventually you should be able to determine the basic causes.Let us now further examine the underlying causes under three of the main groups given above.

Family food shortages: Many families do not have enough food to feed everyone properly throughout the year. But why are these families short of food?

The possible reasons for family food shortages may be that there is a large number of families in the locality, leading to overcultivation of their lands. Another might be the effects of low income or poor budgeting. Some people may spend so much on 'non-essential' things such as 'khat', cigarettes and beer, so there is not enough money left for the family's food needs. There may also be poor distribution of food among families. There will be different causes for food shortages, some depending on the region in which you live. You might have identified large family size, small size of farming land, low income, or extravagance by the husbands on unnecessary items, such as cigarettes and beer.

Inadequate care of children and women: Nutrition and health care are often determined by the amount of care given to women and children, and this is strongly affected by a woman's workload, access to resources and her education.If the mother is busy, she might not have enough time to breastfeed and care for her child. Many women are uneducated and have little knowledge about feeding, childcare and hygiene.

Thus they lack awareness of the correct things to do. These same women often cannot or do not attend clinics or women's groups where they could learn skills to improve their lives and that of their families.Their time fetching water, farming or doing labour work; a minority of mothers may be government employees. If a mother is busy with these and other activities, she may not get time to breastfeed, prepare foods for her children and or ensure her children's hygiene. Children of these mothers may be at higher risk of undernutrition either due to lack of appropriate and adequate feeding, or due to repeated infections as a result of poor sanitary conditions.

Unhealthy environment and poor health services: Disease is more likely to occur, especially among young children, when there are poor living conditions such as overcrowding, low immunization coverage and poor health services.

4.6 Basic causes of malnutrition

- The availability and control of resources (human, economic and organisational) at the various levels of society are a result of four major factors.
- These are political factors, cultural factors, environmental factors, and social factors. Any one or a combination of these can be a basic cause of malnutrition.

4.6.1 Political factors

Certain political factors, such as policy decisions and economic situations caused by inflation or war, can cause undernutrition. A good example was the high level of malnutrition amongst many Ethiopian citizens during the Ethio-Eritrean war.

4.6.2 Cultural factors

Can you think of health beliefs that might contribute to nutritional problems in your own community? There may be many and it can be hard to get people to realise that these beliefs have a negative impact on their or their children's bodies. For example, abrupt weaning due to pregnancy, the belief that food should not be given to a child who is suffering from measles or diarrhoea, and sharing food from the same bowl between different children, can result in the child getting less than their body requirements, are examples of some of the cultural factors that may affect nut

4.6.3 Environmental or natural disasters

Drought, floods and earthquakes are other basic causes that can lead to malnutrition.

The 1977 drought of Ethiopia is a good example of a natural disaster with terrible consequences.

4.6.4 Social factors

Poverty is the reason that some families cannot produce or buy more food. Men often leave home to search for work, leaving women to bring up children alone. Poverty can lead to family quarrels and child abuse. Often women have less access to money, land and other resources, and less control over family decisions than men.You have now studied the causes of undernutrition and thought about how these might be found in your own community. The next section will give you the opportunity to look at some of the common consequences of malnutrition on a community.

4.7 Consequences of malnutrition for communities

The enormous consequences of malnutrition are often not appreciated because they may be hidden. Often there are no obvious signs, and the victims themselves are silent and not aware of the problem. By 24 months, considerable damage to the developing child has been done and satisfactory recovery becomes less likely. Well-nourished women are likely to be fit and healthy and able to look after their family well.

The outcomes of pregnancy and lactation are improved when the woman is healthy herself. As you read in an earlier study session in this Module, the nutritional needs of a pregnant and a lactating woman are greater than at other times in her life. During pregnancy, the food the mother eats also helps to meet the nutritional needs of the unborn baby. During lactation, the food the mother eats helps in production of breast milk.Just as malnutrition has many causes, its effects are also multidimensional in nature.

i. Increased risk of disease and death

Malnutrition, sub-optimal infant feeding practices, and vitamin A deficiency, significantly lower the resistance to infections and dramatically increase the risk of illnesses and death. Millions of children die of severe acute malnutrition each year.

ii. Low productivity of the malnourished individuals

Stunting has a serious impact on the productivity of individuals. Stunted children grow up to become less productive adults. Studies show that labour productivity declines as severity of stunting increases. Iodine deficiency also significantly reduces the productivity of an individual.

iii. Poor school performance and attendance

Proper nutrition is essential for mental and physical development and for school performance. Malnutrition reduces children's learning ability, school performance and attendance.

iv. **Iodine deficiency** lowers the ability of children to think and become creative and productive adults. Iodine is necessary for the normal development of the brain of the fetus during pregnancy.

v. Poverty perpetuation (a vicious circle)

Malnutrition affects children, women, and communities and will prevent them from reaching their full mental and physical. Capacity as we have discussed earlier, a malnourished child will grow to a malnourished adult. The productivity of the adult will be decreased and poverty will continue.

4.8 Strategies to promote proper nutrition in a community

You have now had an opportunity to consider some of the problems of malnutrition, its common causes, and the consequences of malnutrition at family level and community level. As a Health professionalPractitioner you may be able to decrease the rate of malnutrition and minimise the effects of malnutrition on your own community.

There are six strategies that have been found to promote proper nutrition in a community. These are:

I. Basic education
II. Healthy environment
III. Maternal and child care
IV. Healthy social and family life
V. Proper agriculture
VI. Public health measures.

i. **Basic education**: This is a very important for improving child nutrition and care. Therefore advocacy should be done to promote equal chances of education for both boys and girls since this is important to enable them to become better parents themselves.

ii. **Healthy environment**: Availability and easy access to safe and adequate water for drinking, cooking and cleaning are important aspects of each person's development and the maintenance of their health.

iii. **Maternal and childcare**: Prevention of prematurity, proper antenatal care and promotion of good feeding practices are important interventions that may help to decrease malnutrition within your community.

iv. **Healthy social and family life**: Strong family planning services may help families to limit the number of children they have; social integration and communal care may support orphans and children with special needs.

v. **Proper agriculture**: Diversification through planting the right number of different kinds of seeds should be promoted, and food distribution at household level should be equitable, giving children and pregnant mothers priority.

vi. **Public health measures**: These include prevention and treatment of maternal infections during pregnancy and delivery.Immunizations against preventable diseases as well as an emphasis on growth promotion and monitoring activities is also important public health strategies to prevent malnutrition in the community. Part of your role includes working with other professionals and community leaders to help promote these strategies and help improve the nutritional status of people living in your community.

Self-Check-4	Written test

Name: _____Date: _____

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

I-Essay: Explain briefly:

1. List the four major forms of malnutrition in Ethiopia;
2. What are the three classification of sever acute malnutrition?
3. Write the consequence of malnutrition;

Answer Sheet

Score = _____
Rating: _____

Name:_____Date: _____

I- Essay:

1._____

2. _____

3. _____

LG#40 LO#3-Apply feeding infants and children

Instruction sheet

This learning guide is developed to provide you the necessary information

regarding the following content coverage and topics –

- Cleaning and sterilizing infant's feeding bottles.
- Formula milk preparation
- Determining nutritional requirements of infants and children
- Healthy feeding procedures
- Feeding Infants and children

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Know How to use Infants bottles feeding techniques
- Know bottle cleaning and sterilizing procedures are performed
- Know How Milk formula is prepared
- identify Nutritional requirements for infants and children

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the "Information Sheets". Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the "Self-checks" which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to "Operation sheets
7. Perform "the Learning activity performance test" which is placed following "Operation sheets" ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, see your trainer for further instructions or go back to "Operation sheets".

Information sheet-1 Cleaning and sterilizing infant's feeding bottles.

3.1 Cleaning and sterilizing infant's feeding bottles.

Cleaning and sterilization of infant feeding equipment support of breast feeding, which has been strengthened considerably in recent decades, the evidence base for reducing the risks of formula feeding seems to be scanty. It is not clear from the epidemiological literature what proportion of common diseases such as gastroenteritis is an inevitable consequence of the use of a product of lower quality than breast milk and what proportion could be prevented by improved practice. Milk is the perfect medium for growth of bacteria, and therefore poorly cleaned feeding equipment can be a potent source of infection for babies.

Types of cleaninig and sterilizing

There are 3 ways to do this: **boiling**, **steam sterilisation** and **chemical sterilisation**.

Equipment needed

- Bottle with needle
- One can childs formula
- Sterilizer
- Bottle brush
- Sterile gauze pad

Operation sheet 1-claeaning and sterilizing feeding bottle

1. Put all parts of the cleaned bottle, including teats, in a large saucepan.
2. Cover the equipment with tap water.
3. Make sure all air bubbles are out of the bottles and that they are fully submerged under the water.
4. Bring the water to the boil.
5. Boil for 5 minutes.
6. Let the feeding equipment cool in the saucepan before taking it out.
7. Place all the feeding equipment in a clean container and put it in the fridge. Make sure the container is covered firmly with a lid.
8. You can store everything in the fridge for up to 24 hours.

Self-Check 1	Performance test

Name: _____Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **20** minutes. The project is expected from each student to do it.

Task-1 Perform cleaning and sterilizing feeding bottle

Information sheet 2-Introducing standard procedures

1.1 Formula milk preparation

It is very important that you follow the instructions in this booklet when you are:

- sterilizing feeding bottles;
- sterilizing feeding equipment; and
- Preparing infant formula feeds.

2.1.1 Infant formula

Most infant formula is made from cows' milk that has been treated to make it suitable for babies. Goats' milk based infant formula is also approved for use. You should not feed your baby other formulas unless your midwife, health visitor or GP recommends you to. If you think a particular brand of infant formula disagrees with your baby, ask your GP, midwife or health visitor for advice.

2.1.2 Different types of infant formula

Based on preparation Infant formulas come in three forms. The best choice depends on your budget and desire for convenience:

- **Powdered formula.** Powdered formula is the least expensive. Each scoop of powdered formula must be mixed with water.
- **Concentrated liquid formula.** This type of formula also must be mixed with water.
- **Ready-to-use formula.** Ready-to-use formula is the most convenient type of infant formula. It doesn't need to be mixed with water. It's also the most expensive option.

Operation sheet 2- techniques of Preparing a feed using Powdered Infant Formula

It is best to prepare feeds fresh each time and to feed immediately. Hospitals and other care settings will be required to prepare feeds for many infants. Ideally, each feed should be prepared in an individual feeding cup or bottle. However, in certain circumstances, feeds are mixed in larger containers, and then transferred into individual feeding cups or bottles. This practice poses a risk because PIF is more susceptible to contamination in large, open containers. Also, large volumes of feed take much longer to cool, leaving the potential for growth of harmful bacteria. The recommendations below outline the safest practice for preparing feed in individual containers or in batches for immediate consumption:

i. Clean and disinfect a surface on which to prepare the feed.
ii. Wash hands with soap and water, and dry using a clean cloth or a single-use napkin.
iii. Boil a sufficient volume of safe water. If using an automatic kettle, wait until the kettle switches off; otherwise make sure that the water comes to a rolling boil. Note: bottled water is not sterile and must be boiled before use. Microwave ovens should never be used in the preparation of PIF as uneven heating may result in 'hot spots' that can scald the infant's mouth.
iv. Taking care to avoid scalds, pour the appropriate amount of boiled water, which has been allowed to cool slightly, but not below 70 °C, into a cleaned and sterilized feeding cup or bottle. The temperature of the water should be checked using a sterile thermometer.

a. If making a batch in a larger container: the container should have been cleaned and sterilized. It should be no larger than 1 litre, be made from food-grade material and be suitable for pouring hot liquids.

v. To the water, add the exact amount of formula as instructed on the label. Adding more or less powder than instructed could make infants ill.

a. If using feeding bottles: assemble the cleaned and sterilized parts of the bottle according to the manufacturer's instructions. Shake or swirl gently until the contents are mixed thoroughly, taking care to avoid scalds.

b. If using feeding cups: mix thoroughly by stirring with a cleaned and sterilized spoon, taking care to avoid scalds.
c. If preparing a batch in a larger container: stir formula using a cleaned and sterilized spoon to ensure even mixing. Immediately pour into individual feeding cups or bottles, taking care to avoid scalds.

vi. Cool feeds quickly to feeding temperature by holding under a running tap, or placing in a container of cold water or iced water. Ensure that the level of the cooling water is below the top of the feeding cup or the lid of the bottle.
vii. Dry the outside of the feeding cup or bottle with a clean or disposable cloth and label with appropriate information, such as type of formula, infant's name or ID, time and date prepared, and preparer's name.
viii. Because very hot water has been used to prepare the feed, it is essential that the feeding temperature is checked before feeding in order to avoid scalding the infant's mouth. If necessary, continue cooling as outlined in step Vi above. Discard any feed that has not been consumed within two hours.

Necessary equipment for formula feeding

- ✓ Bottles with teats and bottle covers
- ✓ Bottle brush, teat brush
- ✓ Formula milk powder, or sterile ready-to-feed liquid formula
- ✓ sterilising equipment (such as a cold-water steriliser, microwave or steam steriliser)

Self-Check 2	performance test

Name: _____Date: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **30** hour. The project is expected from each student to do it.

Task-1 Perform techniques of Preparing a feed using Podered Infant Formula

Information sheet 3-Determining nutritional requirements of infants and children

3.1. Determining nutritional requirements of infants and children

The common feature of infancy, childhood and adolescence is that all these age groups are undergoing rapid growth and development. This in turn poses a heavy demand on their nutritional requirements. Small children and infants do not have a well developed body nutrient store, and therefore are more vulnerable to infection. In addition they have a larger surface area compared to their body size. All these factors increase their basal metabolic rate (BMR), resulting in an increased requirement for nutrients. **Infancy and childhood**: Poor infant and child feeding practices are the major determinants of malnutrition. A very large proportion of women do not practice optimal breastfeeding and complementary feeding for their children.

- **Key message for optimal breast feeding practice:**
  - ✓ Initiate breast feeding within one hour of birth
  - ✓ Breast feed the child frequently day and night
  - ✓ Exclusive breast feeding for the first 6 months of age
  - ✓ Continue breast feeding more frequently even when the child is sick
  - ✓ Position and attach infant correctly at the breast
  - ✓ Offer the second breast after the infant releases the first
  - ✓ The mother should eat more than usual

Energy

While most adults require 25–30 calories per kg, a 4 kg infant requires more than 100 kilocalories per kg (430 calories/day).

Infants of four to six months who weigh 6 kg require roughly 82 kilocalories per kg (490 calories/day). Energy needs remain high through the early formative years. Children of one to three years require approximately 83 kilocalories per kg (990 calories/day). Energy requirements decline thereafter and are based on weight, height, and physical activity. As an energy source, breast milk offers significant advantages over manufactured formula milk. Breastfeeding is associated with reduced risk for obesity, a wide range of allergies, hypertension, and type 1 diabetes. It is also linked with improved cognitive development; and with decreased incidence

and severity of infections. It is also less costly than formula feeding. The list below outlines the nutrients and other constituents of breast milk:

- ✓ **Water = 87–89%**
- ✓ **Vitamins (particularly vitamin A)**
- ✓ **Fat = 3–5%**
- ✓ **Energy = 60–70 kcal/100 ml**
- ✓ **Carbohydrate (lactose) = 6.9–7.2%**
- ✓ **Mineral = 0.2%**
- ✓ **Protein = 0.8–0.9%**

Higher intakes of protein and energy for growth are recommended for adolescents. For most micronutrients, recommendations are the same as for adults. Exceptions are made for certain minerals needed for bone growth (e.g. calcium and phosphorus). Evidence is clear that bone calcium accretion increases as a result of exercise rather than from increases in calcium intake. Since weight gain often begins during adolescence and young adulthood, young people must establish healthy eating and lifestyle habits that reduce the risk for chronic disease later in life. Water Infants and children need plenty of water to drink, particularly when ill, or exposed to extreme temperatures. Total water requirements (from beverages and foods) are also higher in infants and children than for adults. Children have a larger body surface area per unit of body weight and a reduced capacity for sweating when compared with adults, and therefore are at greater risk of morbidity and mortality from dehydration. Parents may underestimate these fluid needs, especially if infants and children are experiencing fever, diarrhea or exposure to very cold or very hot temperatures.

Essential fatty acids

- ✓ Requirements for fatty acids or fats on a per kilogram basis are higher in infants than adults.
- ✓ Some fatty acids play a key role in the central nervous system.
- ✓ However infants and children should not ingest large amounts of foods that contain

  predominantly fats, so it is important to get the balance right.

Self-Check 3	Written test

Name: _____Date: _____

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

I-Essay: Explain briefly:

1. List some constituents of breastmilk
1. What are the key messages to optimal breast feeding?

Note: Satisfactory rating – 2 points Unsatisfactory – below 2 points

Answer Sheet

Score = _____

Rating: _____

Name: _____Date:_____

I- Essay:

1._____

2. _____

Information sheet 4 Healthy feeding procedures

3.1 Healthy feeding

Appropriate and healthy feeding of your baby during the first year of life is very important. More growth occurs during the first year than at any other time in your child's life. For the first few months, breast milk or formula is all that's needed. As your baby grows, starting a variety of healthy foods at the proper time is important for proper growth and development. And starting good eating habits at this early stage will help set healthy eating patterns for

Feeding guide for your child's first 4 months

Don't give solid foods unless your baby's healthcare provider advises you to do so. Solid foods shouldn't be started for infants younger than age 4 months for the following reasons:

- Breast milk or formula gives your baby all the nutrients that are needed to grow.
- Your baby isn't physically developed enough to eat solid food from a spoon.
- Feeding your baby solid food too early may lead to overfeeding and being overweight.
- As a general rule, solid foods don't help babies sleep through the night.

All infants, children, and teens need to take in 400 IU of vitamin D each day to prevent complications from deficiency of this vitamin. This can be through supplements, formula, or cow's milk. This should start soon after birth. Your baby's healthcare provider can recommend the proper type and amount of vitamin D supplement for your baby.

Table # 5 feeding guide for infant 0-5 months

Age	Amount of formula per feeding	Number of breast or formula feedings per 24 Hours	Maximum volume of formula per 24 hours
1 month	2 to 4 ounces	6 to 8 times	24 ounces
2 months	5 to 6 ounces	5 to 6 times	32 ounces
3 to 5 months	6 to 7 ounces	5 to 6 times	32 ounces

Breastfeeding mothers often wonder how they know their baby is getting enough. What goes in must come out, so counting wet diapers is a good way to know your baby is getting plenty. In the first few days of life, your baby should have at least 5 wet diapers daily. If you notice your baby having fewer wet diapers, you should contact your baby's healthcare provider or lactation consultant for help right away.

Feeding tips for your child

These are some things to consider when feeding your baby:

- When starting solid foods, give your baby 1 new food at a time. Don't use mixtures like cereal and fruit or meat dinners. Give the new food for 2 to 3 days before adding another new food. This way you can tell what foods your baby may be allergic to or can't handle.
- Start with small amounts of new solid foods. Try a teaspoon at first and slowly increase to a tablespoon.
- There are no strict rules about what order you should give different foods in. Many people start with an infant cereal and slowly add fruits, vegetables, and proteins.
- Don't use salt or sugar when making homemade baby foods. Canned foods may contain large amounts of salt and sugar and shouldn't be used for baby food.
- Don't feed homemade spinach, beets, green beans, squash, or carrots to babies younger than age 6 months. These foods can have high amounts of nitrates. This raises the risk for a blood disorder (methemoglobinemia) that can interfere with oxygen delivery in the blood.
- Always wash and peel fruits and vegetables and remove seeds or pits. Take special care with fruits and vegetables that come into contact with the ground. They may contain botulism spores that cause food poisoning.
- Cow's milk shouldn't be added to the diet until your baby is age 12 months. Cow's milk doesn't provide the right nutrients for your baby.
- Fruit juice without sugar can be started when your baby is able to drink from a cup (around age 6 months or older). But, it's not a necessary part of a healthy infant's diet and should be limited to a maximum of 4 to 6 ounces daily. Fruit juice is linked to both obesity and malnutrition in children. Whole fruits and vegetables are a much healthier option.

- Feed all foods with a spoon. Your baby needs to learn to eat from a spoon. Don't use an infant feeder. Only formula and water should go into the bottle.
- Avoid honey in any form for the first year because it can cause a type of botulism.
- Don't put your baby in bed with a bottle propped in his or her mouth. Propping the bottle is linked to ear infections and choking. Once your baby's teeth are present, propping the bottle can cause tooth decay.
- Your baby's healthcare provider can advise you on how to wean your baby off the bottle.
- Avoid the clean plate syndrome. Forcing your child to eat all the food on his or her plate even when he or she isn't hungry isn't a good habit. It teaches your child to eat just because the food is there, not because he or she is hungry. Expect a smaller and pickier appetite as your baby's growth rate slows around age 1.
- Healthy babies usually need little or no extra water. Ask your child's healthcare provider about giving your baby additional fluids throughout the day. Once your child is taking solids, offering sips of water is usually fine.
- Don't limit your baby's food choices to the ones you like. Offering a wide variety of foods early can help lead to good eating habits later.
- Fat and cholesterol shouldn't be limited in the diets of babies and very young children, unless advised by your baby's healthcare provider. Children need calories, fat, and cholesterol for healthy growth.

Signs of good and poor attachment

- The four signs of good attachment are:
- More of the areola is visible above the baby's top lip than below the lower lip;
- The baby's mouth is wide open;
- The baby's lower lip is curled outwards;
- The baby's chin is touching or almost touching the breast.

Self-Check 4	Written test

Name: _____Date: _____

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

I-Essay: Explain briefly:

2. Explain what does by healthy feeding procedures?

3. Identify the four sign of good attachments;

Note: Satisfactory rating – 2 points Unsatisfactory – below 2 points

Answer Sheet

Score = _____
Rating: _____

Name: _____Date:_____

I- Essay:

1._____

2. _____

Information sheet 5	Feeding Infants and children

5.1 Initiation of breastfeeding

Initiating breastfeeding within one hour protects the infant from disease by providing the thick, yellowish first milk (colostrum) which is the equivalent to the infant's first vaccine. It also helps to expel the placenta more rapidly and reduces blood loss by the mother. It also helps expel meconium (the infant's first stool), stimulates further breastmilk production and keeps the newborn warm through skin-to-skin contact. The Baby-friendly Hospital Initiative (BFHI) assessment tool suggests that the baby should be placed "skin-to-skin" with the mother within the first half-hour following delivery. Within the first hour, assistance with positioning and attachment should be given, or if the mother has had a caesarean section, within an hour of when she is able to respond.Often, mothers who have undergone caesarean section need extra help with breastfeeding. Otherwise, these mothers on average initiate breastfeeding much later and terminate breastfeeding sooner. Optimally, the baby should be breastfed any routine procedure (such as bathing, weighing, umbilical cord care, administration of eye medications) is performed. Early breastfeeding enhances bonding, increases chances of breastfeeding success, and generally lengthens the duration of breastfeeding.

5.2 Exclusive breastfeeding

Exclusive breastfeeding in the early months of life is correlated strongly with increased infant survival and lowered risk of illness, particularly from diarrheal disease. To achieve optimal growth, development and health, WHO recommends that infants should be exclusively breastfed for the first six months of life. This is formulated in the Conclusions and Recommendations of a WHO Expert Consultation held in March 2001, which completed a systematic review of the optimal duration of exclusive breastfeeding.

5.3 Duration of breastfeeding

The Innocenti Declaration recommends that babies continue to be breastfed for up to two years of age or beyond. When provided along with appropriate and adequate complementary food, breast milk continues to be an important source of nutrition and fluids and immunological protection for the child after six months of age. The continued bonding between mother and child provided by breastfeeding encourages optimal psychosocial development.

5.4 Bottle-feeding

Babies should be breastfed exclusively until six months (180 days) of age. If unable to feed directly from the mother's breast, the baby should be fed breast milk from a cup. (If the baby is unable to swallow, breast milk can be provided by means of an infant-feeding tube.) After six months of age, any liquids given should be fed by cup rather than by bottle. Feeding-bottles with artificial nipples and pacifiers (teats or dummies) may cause nipple confusion and infants may refuse to breastfeed after their use. Feeding-bottles are more difficult to keep clean than cups, and the ingestion of pathogens can lead to illness and even death. Pacifiers can also easily become contaminated and cause illness.

5.5 Complementary feeding

Because babies need nutritious foods in addition to breast milk from the age of six months, WHO recommends that babies should begin receiving complementary foods at that age. Locally available and affordable foods that enrich the baby's diet with additional calories and micronutrients should be offered – soft or mashed – in small quantities, several times a day. These complementary foods should gradually increase in amount and frequency as the baby grows. Breastfeeding, on demand, should continue until the age of two years or beyond. The indicator proposed here measures the percentage of babies fed complementary foods from ages six through nine months, while continuing to breastfeed.

Self-Check 5	Written test

Name: _____**Date:** _____

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

I-Essay: Explain briefly:

1. Describe the advantages of initiation of breast feeding;

Note: Satisfactory rating – 2 points Unsatisfactory – below 2 points

Answer Sheet

Score = _____

Rating: _____

Name: _____Date:_____

I- Essay:

1._____

2. _____

LG#41	**LO#4 apply nutritional assessment and intervention**

Instruction sheet

This learning guide is developed to provide you the necessary information

regarding the following content coverage and topics –

- Nutritional guide line
- Nutritional assessment
    - ✓ Nutritional assessment tool
    - ✓ Organization's reporting process
    - ✓ Monitoring own service area
- Nutritional intervention

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Know how Nutritional assessment is applied by using nutritional guide line.
- Describe how the Nutritional intervention is addressed based on the guideline.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information Sheet 1-Apply nutritional assessment and intervention

1.1 Nutritional guide line

This guideline is presented in 3 parts:

i. Nutrition Strategies in Emergency Situations
ii. Rapid Nutrition Surveys
iii. Selective Feeding Programmes

i. Nutrition Strategies in Emergency Situations

In emergency situations, food security is often severely threatened causing increased risk of Malnutrition, disease and death. Emergency health workers/organizations have the responsibility to try to cure the malnourished, prevent malnutrition amongst the vulnerable and promote adequate distribution of food to allow a healthy existence. The complexity of food and nutrition as an issue means that the best response to a situation depends on the context.

Malnutrition, food insecurity and famine

Household <<food security>> is a concept that refers to the ability of a household to feed its members, enabling them to live full and active lives. Inadequate household food security for a population, on short or long term basis may lead to different forms of chronic and or acute malnutrition. While malnutrition is a disease of the individual, the causes of malnutrition are often complex and multi-sectoral, and are linked to different social and economic factors. Action to improve household food security (improve availability and access to food) may need to cover a broad range of sectors (agricultural, land ownership, price supports, inflation, taxation, etc.). In emergency contexts, there is often a sudden and massive reduction in food availability (drought, conflict, isolation, siege, transport problems) or reduction in food accessibility some sections of the community (displacement, reduced purchasing power, increased prices). The result is often acute and severe food insecurity, which may lead to high levels of malnutrition and mortality.

The process of food shortage leading to famine has been described in different phases:

a Change of behaviour to cope with hard times (rationing of food, sale of excess cattle,etc.).

b Sale of capital and income earning assets - which means future prospects are damaged (loans, sale of essential tools, land or cattle).

c Break down of established life patterns and destitution (distress migrations, reliance on aid, etc.).

d Starvation and death - famine.

ii. **Rapid Nutrition Surveys**

Introduction to anthropometric surveys

When dealing with populations in emergency situations (refugees or displaced people), planners, health officers and officers in charge need to evaluate the nutrition situation quickly and precisely.

This evaluation is based on surveillance data, demographic indicators, direct observation, advice from experts and in some cases rapid anthropometric surveys. The quick anthropometric assessment survey (measuring the prevalence of malnutrition) is one of the many tools for evaluation of the nutrition situation, allowing the quantification of malnutrition in the population.

Anthropometric surveys: why and when?

In the initial phase of an emergency, to assess the situation and take short term relief action. In the course of a programme, to assess the evolution of nutritional status, to redirect nutritional programmes and to assess their coverage and impact. The survey may also help in assessing the impact of the programme: was the prevalence of malnutrition reduced ? Was the target population covered ?

In the course of a programme, when deterioration or amelioration of nutritional status is suggested by various sources of information: clinics, food availability. However, an anthropometric survey is not always a priority in emergency situations. A rapids creening of children presenting a high risk of mortality may be needed urgently in order to take immediate life saving action. An anthropometric survey only becomes a priority when there is an urgent need for intervention in order to take decisions to implement actions.

Objectives for surveys

The objectives should include notions of time, place and persons. The objectives of anthropometric surveys may be:

- To quantify malnutrition in a specified population, at a given time, using indicators of malnutrition;
- To identify higher risk groups. These may be a certain age group, newly arrived refugees, nomads as compared to sedentary people, etc...;
- To estimate the number of children who may benefit from a nutrition programme, e.g. how many children should be expected to need treatment in an intensive feeding care unit with an entry criteria based on a given nutrition index value ? How many children could be eligible for supplementary rations?
- To assess trends in nutrition status based on repeated surveys;
- To evaluate a programme in comparison with a target objective;
- To compare the nutrition status of refugees and the local population.

Preparing to do a survey

Meet the people in charge

Most of the time a survey is carried out in response to the needs for information expressed by the people in charge. The objectives have to be precisely specified with them at this point. They need to understand the methodology used, its constraints, the means required and the limitations of the expected results. People in charge may provide a map of the camp or of the region, and a list or a register of the refugees if available.

Gather available information

Before starting the anthropometric survey, all locally available information should be gathered.

- Have there been any previous surveys?
- What were the findings andrecommendations?
- Is there a reliable mortality surveillance system?
- What information related to food resources is available?
- Collecting demographic information prior to the survey is essential when this information is not readily available or reliable.

Define data to be collected, the plan of analysis and the questionnaire

During an anthropometric survey, the following basic data needs to be collected:

- Weight
- Height
- Age
- Sex
- Oedema and possibly, according to the specific objectives of the survey:
- Measles immunization status
- Date of arrival in the camp
- Availability of cooking equipment/fuel at the household level.
- Availability of food- etc.

B. Anthropometric measurements and indices

- Anthropometry is the measurement of the human body.
- Body parameters such as weight and height are used to assess nutritional status.

The various anthropometric indicators and the method of measurement

- Many body parameters can be used to assess individual nutritional status.
- The weight, the height and the mid upper arm circumference are the most commonly used, but skin-fold thickness and various other measurements are sometimes used.

Weight

- A 25 kg hanging spring scale, graduated by 0.100 kg, is used.
- The scale is hooked to a tree, a tripod or a stick held by two people.
- The weighing pants are suspended from the lower hook of the scale, and the scale is readjusted to zero.
- The child's clothes are removed and the child is placed in the weighing pants.
- The pants then hang freely from the hook.
- In cold countries or in certain cultures it might be impossible to undress a child. The average weight of the clothes should be evaluated and deducted from the measure.

- If the child is moving and the needle does not stabilize, the weight should be estimated by recording the value situated at the mid-point of the range of oscillations.

Height

- Children aged more than 2 years old are measured standing up.
- Children less than 2 years old are measured lying down. If the age is difficult to assess, children of more than 85 centimetres are measured standing, those less than or equal to 85 centimetres, lying down.
- For children of more than 2 years, the measuring board is set up in a place where there is room for movement.
- The child's shoes are removed.

The child's head, shoulders, buttocks, knees and heels should be touching the board.

- The measurer reads the measure to the nearest 0.1 centimetre.
- The assistant writes down the measurement and repeats it to the measurers to make sure it has been correctly heard and recorded.

For children of less than 2 years old, the measuring board is placed on the ground.

- The child is gently placed, lying down the middle of the board.
- The assistant holds the sides of the child's head and positions the head until touching the foot board.
- The measurer places his hands on the child's ankles or knees.
- While positioning the child's legs, the positions the cursor up against the bottom of the child's feet, which should be at right angles.

Age

If birth dates have been recorded on a health card or immunization card, determination of age is simple. In such cases, the date of birth is directly recorded onto the questionnaire in order to avoid mistakes in calculating the age. If birth dates are not recorded, a local calendar of events is used. The mother is asked whether the child was born before or after certain major events until a fairly accurate age is pinpointed. If that is not possible, children are selected on the basis of height. Only children more than 65 centimetres and less than 110 centimetres tall should be included in the sample.

Oedema

In order to determine the presence of oedema, normal thumb pressure is applied to the foot or the leg for three seconds (3 seconds is approximately the time necessary to say one thousands and one, one thousand and two, one thousand and three). If a shallow print or pit remains when the thumb is lifted, then the child has oedema. Nutritional oedema should be found on both feet and legs. Only children with oedema on both feet and legs are classified as having nutritional oedema.

Mid upper arm circumference (MUAC)

- Mid upper arm circumference is measured on the left arm, at the mid-point between the elbow and the shoulder.
- The arm should be relaxed.
- A special measuring tape is placed around the arm.
- The measurement is read from the window of the tape without pinching the arm or leaving the tape loose.
- The mid upper arm circumference is recorded to the nearest 0.1 centimetre.

C. Sampling methods

Principles of sampling

If all individuals in a given population were surveyed, we would get a precise picture of the nutritional status of this population. An exhaustive survey of this type would be long, costly and difficult to carry out. This is why measurements are only recorded for a sub-group of th population, called a sample, which "represents" the whole population. In fact, only children aged 6-59 months (65-110cm) are included in the target population, since it is this group which will best reflect the nutritional status of the population. If the main objective of the survey is to compare two groups according to their nutritional status, two different surveys, one for each group, are required.

Representativeness of the sample

- The representativeness of a sample is essential.
- It is the prerequisite for extrapolation of results observed for the sample to the entire population.
- In order for a sample to be representative of the population, two criteria should be met: each individual should have an equal chance of being selected

for the sample, and the selection of one individual should be independent of the selection of another individual.

Probability

- Whenever a sample is drawn, a probability of error exists, meaning that there is a risk that the sample may not be truly representative of the population.
- In nutrition surveys, we accept an error risk of 5%.
- This means that we accept that in 5% of the surveys, results observed for the sample will not reflect the true nutritional status of the population.
- In other words, whenever an organization carries out 100 nutrition surveys, 5 of them will give a result not reflecting the true situation.

Precision, the confidence interval

By carrying out measures on a sample of the population, we only get an estimation of what the results would be if they were carried out on the entire population. If a second sample is drawn out of the same population, slightly different results may be obtained just because of the variation of the children selected for the samples. The actual percentage of malnutrition in the entire population lies in a range around the observed value. The upper and lower limit of this range determines the confidence interval of the estimation. For example results will be expressed as follows: malnutrition rate = 13% + 5%, meaning the confidence interval ranges from 8% to 18%. The size of the confidence interval is related to the error risk and the size of the sample.

Sample size

- The sample size is related to three factors:
- The expected precision: the greater the precision desired, the more people needed in the sample.
- The probability of error chosen: the smaller the probability, the more people needed in the sample.
- If the whole population is surveyed, the probability is zero. In nutrition surveys, an error risk of 5% is accepted.

Calculation of the sample size

When calculating the size of the sample the three factors previously defined should be taken into consideration.

The formula used is the following

$$n = t^2 \times (p \times q) / d^2$$

n = sample size

t = parameter related to the error risk, equals 1.96 or 2 for an error risk of 5%

p = expected prevalence of malnutrition in the population, expressed as a fraction of 1

q = 1 - p, expected proportion of children not presenting malnutrition, expressed as a fraction of 1.

d = absolute precision, expressed as a fraction of 1.

Practically:

<<t>> is fixed 1.96 (or 2) in this type of survey (corresponding to an error risk of 5%

<<p>> and thus <<q>> (q = 1-p) are estimated from previous surveys

D. Analysis, interpretation and recommendations

- The analysis is composed of two parts:
- A descriptive analysis, which consists of building distributions according to the variables.
- An interpretative analysis where cross tabulations are used to make comparisons between groups.
- The analysis uses the weight/height index values.
- There are two approaches when analyzing and presenting results:
    - The first approach estimates the proportion of children with W/H index falling below a cut off value.
    - The second approach describes the whole distribution of children according to index values (= standard prevalence).
- These two approaches are complementary.
    - ✓ If the survey's objectives are to quantify the number of children who may benefit from an intensive feeding programme or from supplementary rations based on a cut-off value of the index, the first approach is the most appropriate. However, if the objective is to assess the overall impact of a programme on the whole population of children, the second approach is preferred. In this Part, we will only develop the first approach.

Description of the sample

The first step in the analysis is to describe the sample, by describing the distribution of characteristic variables. This will indicate if the sample is made up from eligible children. For example, a distribution according to age will give the proportion of children less than 6 months or more than 59 months, which should not have been included in the sample. An age pyramid can demonstrate an under-representation of an age group in the sample.

Definition of nutrition indicators

The two main signs of acute malnutrition described in the chapter concerning the antropometric measures are : a decrease in the value of the W/H index and the presence of oedema.The combination of these two signs and a cut off value for the index are used to define 2 classes of malnutrition:

- ✓ Global acute malnutrition : proportion of children with a weight / height index <- 2 Z-Scores or oedema
- ✓ Severe acute malnutrition : proportion of children with a weight / height index <- 3 Z-Scores or oedema

Calculation of malnutrition indicators

To start with, the number of children presenting with oedema is calculated (2 in our example). Then the number of children presenting with a weight / height index <- 3 Z-Scores and not presenting oedema is calculated. These two numbers are added in order to determine the total number of children with severe acute malnutrition (5 in our example). This number is then expressed as a proportion of the total number of children (5 /510 = 10%) Then these steps are repeated using - 2 Z-Scores as the cut off , in order to determine the number of the children who are defined as globally acutely malnourished (39 in our example). Again this result is expressed as a proportion of the whole sample (39 /510 + 7.6 %). A distribution table can be drawn up using the value of the index and the presence of oedema in order to determine the number and proportion of children presenting:

- Kwashiorkor: Oedema + index >-2 Z-Scores
- Marasmic/Kwashiorkor: Oedema + index <-2 Z-Scores

- Marasmus: No oedema + index <-2 Z-Scores
- Normal: No oedema + index >-2 Z-Scores

Expression of results with their confidence intervals

When calculating the sample size, the notion of precision was introduced. This is the reason why the proportion of children presenting with malnutrition should be expressed with a corresponding precision which determines the 95% confidence interval.

Self check #1	Written test

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

I-Essay: Explain briefly: 4% score

1.what is Anthropometry

3. list the three parts of nutrition guidelines

Note: Satisfactory rating – 2 points Unsatisfactory – below 2 points

Answer Sheet

Score = _____
Rating: _____

Name: _____Date: _____

I- Essay:

1._____

2,_____

3,_____

Information Sheet 2- Nutritional assessment

2. Nutritional assessment

Assessment: is a process of gathering, analyzing & interpreting data

Nutritional assessment: is the collection, analyzing and interpretation of anthropometric, biochemical, clinical and dietary data to determine whether a person or groups of people are well nourished or malnourished.

Nutrition surveys: data is collected only once

- ✓ Baseline nutritional status of a population is established
- ✓ Geographic areas and sub-groups that are malnourished are identified
- ✓ Policies are formulated

Nutrition surveillance: data is collected over time on same groups:

- ✓ Can identify both acute & chronic malnutrition
- ✓ Seasonal differences are identified
- ✓ Possible causes of malnutrition for intervention programs
- ✓ Monitoring and evaluating of nutrition interventions

Nutrition screening: data is collected on whole population or only those at risk.

- ✓ Simple & cheap measurements for large scale surveys
- ✓ Data compared to cutoffs to assess population at risk
- ✓ Emergency situation-for selective feeding programs

Nutritional Assessment Methods: include anthropometric, biochemical, clinical, dietary and ecological/other methods. These methods can be used either alone or more effectively in combination

ii) Nutritional assessment tool

I. Anthropometric Measurements

- Anthropometry: anthropo-(human), metry-(measurement)
- It refers to the measurement of the variation of physical dimensions and the gross composition of the human body at different age levels and degrees of nutrition.
- It is useful for assessment of chronic imbalances of protein and energy

- Provides information about past nutritional history

Anthropometric Measurements of Growth.

Length

- A wooden measuring board (sliding board) is used for measuring the length of children under **two years** old in lying (supine) position.
- To measure the length of a child under two years, we need one assistant and a sliding board.

Height

- This is measured for children who are two years old or more and adults in a standing position.
- The head should be in the Frankfurt position during measurement, and the shoulders, buttocks and the heels should touch the vertical stand
- Either a stadiometer or a portable anthropometre can be used for measuring height.
- Measurements are recorded to the nearest millimeter.

Weight

- A weighing sling (spring balance), also called the 'Salter Scale' is used for measuring the weight of children under **two years** old.
- In adults & children $\geq$ 2 years, we use beam balance
- In both cases, a digital electronic scale can be used
- Do not forget to re-adjust the scale to zero and to check whether the scale is measuring correctly by weighing an object of known weight

Head Circumference

- Is the measurement of the head along the supra-orbital ridge anteriorly and occipital prominence posteriorly.
- It is measured to the nearest millimeter using flexible, non-stretchable measuring tape around 0.6 cm wide.
- It assesses chronic nutritional problems in children $\leq$ 2 years of age (the brain grows faster during this period)
- After 2 years of age, the growth of the brain is more sluggish and head circumference is not useful.

Anthropometric measurements of body composition

- Linear growth ceases at around the age of 25-30 years.
- The main purpose of nutritional assessment of adults using anthropometry is determination of the changes of body weight & body composition.

Body fat

- **Skin folds**: estimate size of subcutaneous fat and assumes that thickness of subcutaneous adipose tissue reflects total body fat.

Lean Mass (Muscle mass)

- **MUAC measurement:** a non stretchable tape is placed at the midpoint of the non-dominant arm
  - ✓ Arms hanging loosely at side with palm facing inward
  - ✓ Do not squeeze arm; use flexible non-stretchable tape
  - ✓ A special tape is used for measuring the MUAC of a child which has three colors
    - **The red indicating severe acute malnutrition**
    - **The yellow indicating moderate acute malnutrition**
    - **The green indicating normal nutritional status**
  - ✓ **MUAC** is the only anthropometric measurement to assess nutritional status of pregnant women
  - ✓ It is used as a screening tool for community based nutrition programs such as:
  - ✓ Outpatient therapeutic programs (OTP)
  - ✓ Community-based interventions
  - ✓ Supplementary feeding programs
  - ✓ Enhanced outreach programs

Indices

An index is a combination of two or more measurements, For example:

- ✓ Weight/age (W/A) = (Child weight/weight of the reference child of the same age) x 100
- ✓ Weight/height (W/H) = (Child wt/wt of the reference child of the same height)x 100
- ✓ Height for age (H/A) = (Child height/height of the reference child of the same age)x 100

- ✓ BMI = Weight (in kg)/ (Height in meter)^2

Weight-for-Age

- Weight-for-age is an index used in growth monitoring for assessing children who may be **underweight**.
- Commonly assess weight-for-age of all children< 2 years old during community-based nutrition (CBN) activities.
- Prevalence of underweight was a Millennium Development Goal Indicator.

Height-for-Age

- Height-for-age is an index used for assessing stunting.
- Stunted children have poor physical and intellectual performance and lower work output leading to lower productivity at individual level and poor socioeconomic development at the community or national level.
- Stunting of children in a given population indicates the fact that the children have suffered from chronic malnutrition so much.

Weight-for-Height

- This is used to assessing wasting (acute malnutrition)
- Wasted children are vulnerable to infection and stand a greater chance of dying.

Body Mass Index (BMI)

- Is used to classify overweight & obesity and Chronic Energy Deficiency (CED) in adults
- Correlates with laboratory-based measures of adiposity
- Used in large-scale surveys: because it is easy, quick, non-invasive
- BMI doesn't distinguish whether the weight is due to muscle or fat
- High BMI can be due to excessive adiposity, muscularity or edema
    - ✓ It is considered as a good index of body fat stores
    - ✓ Best used for individuals between the ages of 20 and 65 years, but it can also be used for children as BMI-for-age

Self check #2	Written test

Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.

I-Essay: Explain briefly: 4% score

1. Give some Explanation about MUAC
2. Identify the three different colors tapes during MUAC measuring

Note: Satisfactory rating – 2 points Unsatisfactory – below 2 points

Answer Sheet

Score = _____

Rating: _____

Name: _____Date: _____

I- Essay:

1._____

2,_____

3,_____

Information sheet 3-Nutritional intervention

3.1 Introduction

Nutrition Intervention: is defined as purposefully planned actions intended to:

- Positively change a nutrition-related behaviour or environmental condition, for an individual, target group, or the community at large.
- Corrective measure that is undertaken to resolve nutritional problem
- Nutrition intervention is directed at the etiologic or causes of a diagnosis (nutrition problem)
- In the Ethiopian context, the commonest nutritional problems are **deficiency diseases**
- Nutrition intervention consists of two components:
  - ✓ Planning
  - ✓ Implementation

General principles of nutrition intervention

- Should consider the conceptual framework (layers of causes and life cycle wise)
- Should integrate long term and short term intervention
- Every sector is responsible (multi-sectoral intervention)
- Should consider sustainability and participation of the beneficiaries

I. Preventive nutrition interventions

- **Dietary modification** (targets the immediate causes)--for diet deficient of nutrients
- **Dietary diversification** (targets underlying causes)--for poor dietary practices due to lack of knowledge or lack of access to food
- **Economic approaches** (targets basic causes of malnutrition)--lack of access to food and money to buy foods, by increasing the educational level of the community, enhancing establishment of micro financing, increasing job accessibility etc...

Dietary modification methods

i Fortification (iodine, infant formulas)

ii Supplementation

- Vitamin A (targets children 6-59 months and lactating mothers)
- Iron (pregnant, lactating women, adolescents, and children < 5 years)
- Folic acid (pregnant women)
- Zinc (children < 5 years with diarrhoea)

iii Germination and fermentation

iv Cooking in iron pots (add iron to the food)

Curative/Rehabilitative Interventions

Therapeutic Feeding Program

TFPs provide a rehabilitative diet together with medical treatment for diseases and complications associated with severe acute malnutrition. The specific aim of TFPs is to reduce mortality among severely malnourished individuals and to restore health TFPs may be administered through the following venues:

1. Therapeutic Feeding Centre **(TFC)**
2. Nutrition Réhabilitation Unit **(NRU),** in hospital or health facility
3. Community-Based Therapeutic Care **(CTC/OTP)** program

Traditional TFP is given only at TFC or NRU

Phase-I

- All SAM cases are admitted to a health facility
- Uses therapeutic milks called Formula 75 (F75) and Formula 100 (F100)
- Phased management

Transition phase

- Children improving in phase-I and uses F100
- Lasts 2-4 days until edema subsides, appetite has returned, no illness, no NGT or IV

Phase II

- The last phase, all from transition phase, uses F100
- Children stay until edema has disappeared for 10 days or weight for height is >85% for 2 consecutive days

Feeding Formulas (F-75)

- Starter formula for stabilisation
- Continue for 2-7 days in phase-I
- Contains 75 kcal and 0.9g protein/100 ml

Feeding Formulas (F-100)

- Catch–up Formula
- Transition Phase
- Phase-II
- Contains 100 kcal & 2.9g protein/100 ml

TFP at Community Based Therapeutic Care (CTC)

- **A new approach (2003/4) to alleviate acute malnutrition in emergencies**
  - ✓ Aim to treat malnourished people in a timely, effective and cost efficient manner.
  - ✓ CTC assists the majority of people suffering from acute malnutrition in their homes.
  - ✓ It integrates supplementary and therapeutic feeding, hygiene and health promotion.
  - ✓ Uses Ready to Use Therapeutic Food (RUTF) called plumpy nut
  - ✓ Uses Outpatient Treatment Program (OTP) for 85-90% treatment of severe malnutrition at home
  - ✓ Small referral inpatient units for those with no appetite or complications called stabilization center (10-15%).

The core principles of CTC are:

- **Maximum coverage and access**: providing people with good access to services
- **Appropriate care**
- **Care as long as it is needed**
- **Timeliness**-case finding & rx before complications occur
- **Sectoral integration**

The Components of CTC

1. Stabilization Center (SC)

– For 15% of SAM cases with poor/no appetite, clinically complicated, +++ edema and Marasmic-Kwash cases

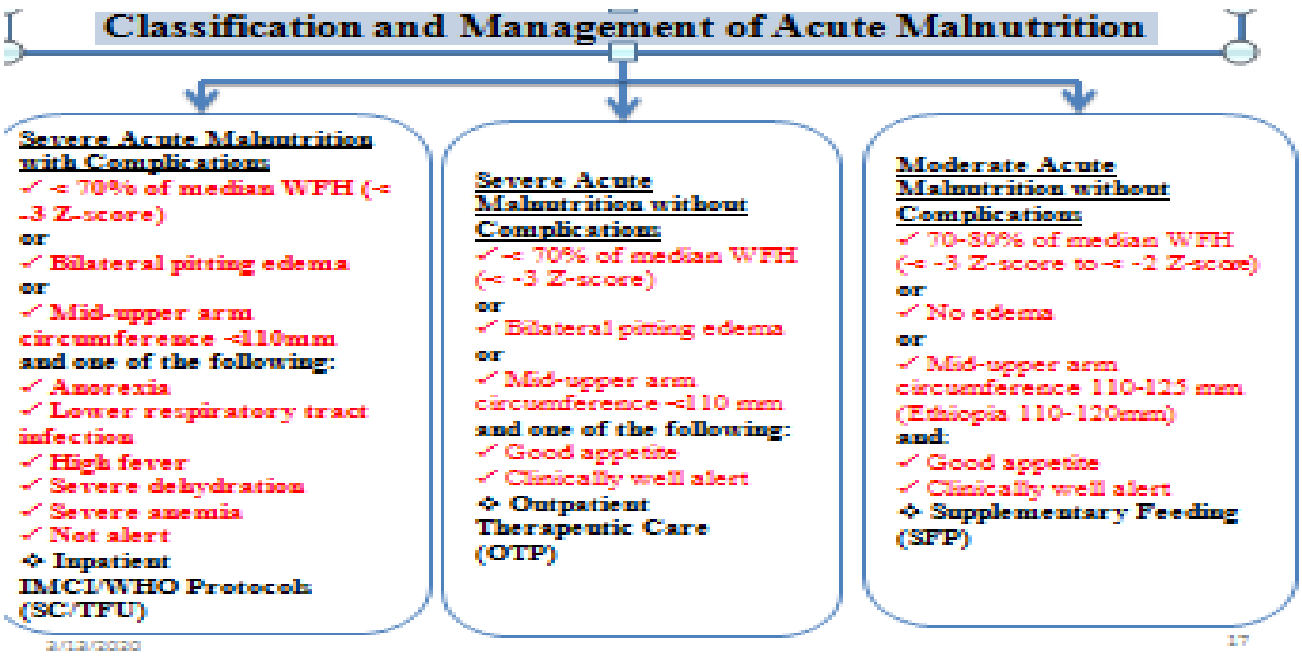
2. Outpatient Therapeutic Program (OTP)

– For 85% SAM with good appetite and no medical complication

3. Supplementary Feeding Program (SFP)

– For MAM children

Classification and Management of Acute Malnutrition



1. Inpatient/phase-I in health facility/SC/TFU

- SAM cases with no appetite or severe medical complication or marasmic kwash (edema with WFH<70% or MUAC<11cm) or +++ edema cases
- Uses F75 therapeutic milk or diluted F100
- Routine drugs (amoxicillin, vitamin-A, folic acid)
- Measles immunization
- 5-10 days as an SC/TFU
- To normalize metabolic functions and electrolyte imbalance, not for weight gain

2. Transition Phase in SC/TFU

- To avoid a sudden change to large amount diet, before physiologic functions are restored which can lead to electrolyte disequilibrium, it is better to introduce them an energy dense therapeutic food
- Only in TFU
- Uses F100 or RUTF (Plumpy'nut).
- A 30% increase in Energy and weight gain up to 6g/kg/day

3. Outpatient (OTP) or Phase II outpatient

- Management in outpatient setups
- Includes SAM cases with good appetite, no medical complications, alert, no edema and no marasmic-kwash
- Uses F100 or RUTF (plumpy'nut),
- Routine drugs (amoxicillin, vitamin-A, folic acid, albendazole/mebendazol)
- Management with weekly follow up: rapid weight gain more than 8g/kg/day

Admission Criteria: all SAM cases should be admitted to a therapeutic feeding program, either inpatient or outpatient

- **Age 6months to 18yrs:** WFH or WFL < 70%, or MUAC <11cm, or Bilateral pitting edema
- **Adults:** MUAC <17cm, or MUAC <18cm with recent weight loss or underlying chronic illness, or BMI <16, or Bilateral pitting edema (other cause excluded)

Admission Procedure

- Anthropometry (weight and height measurement) retaken at TFU/OTP
- Do appetite test
- Categorize for inpatient/SC/TFU or outpatient/OTP admission
- Community: screen by MUAC & edema

Criteria for OTP Admission

- All children with SAM, which means
  - ✓ weight for height<70%,
  - ✓ MUAC<11cm
  - ✓ edema +/++ and
  - ✓ Passed appetite test
  - ✓ Clinically well
  - ✓ Alert/awake
  - ✓ No edema
  - ✓ Do not have marasmic-kwashiorkor

Criteria for Inpatient/SC/TFU admission

All SAM who have:

- ✓ Failed appetite test
- ✓ Marasmic kwashiorkor
- ✓ edema
- ✓ Medical complications like: intractable vomiting, severe dehydration, hypothermia, high grade fever, fast breathing, chest in drawing, extensive skin lesions/infections, very weak, lethargic, unconscious, convulsion,
- ✓ very pale, jaundice, any condition needing infusion or NGT (Naso-Gastric Tube)

Self check 3	Written test

- Directions: Answer all the questions listed below. Use the answer sheet provided in the next page.
- **I-Essay: Explain briefly: 4% score**

1. List the three classification and managements of acute malnutrition
2. What are the components community based therapeutic care

Note: Satisfactory rating – 2 points Unsatisfactory – below 2 points

Answer Sheet

Score = _____

Rating: _____

Name: _____Date: _____

I- Essay:

1._____

2,_____

3,_____

Reference

1. WHO Nutritional guideline 2019
2. WHO, ESSENTIAL NUTRITION ACTIONS mainstreaming nutrition through the life-course
3. Guiding Reference for implementation, CMAM project; Save the children November, 2013.
4. Modern Nutrition in Health and Disease. Maurice E. Shils 1994.
5. Michel Golden. The Management of Severe Malnutrition a Suggested Manual for Ethiopia, July 2002 6. G.
6. Modern Nutrition in Health Research Council. National Academy Press, 1989.

Web

1. e-Library of Evidence for Nutrition Actions (eLENA)
2. https://openoregon.pressbooks.pub/nutritionscience/
3. **https://www.boxingscene.com/nutrition/56270.php**

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Answear to the moduoe self checks

LO# 1

Self check 1

1. Diet: is the sequence of meals in a day (per 24 hours)

2. **Nutrient**: is an active ingredient in the food that play specific structural or functional role in the body's lively activity. More than **50** nutrients are currently identified.

3. **Malnutrition:** pathological state resulting from a relative or absolute deficiency or excess of one or more essential nutrients (primary vs. secondary malnutrition)

Self check 2

5. List type of macronutrients

    - Carbohydrate
    - Protein
    - Fats
    - water

6. Which type of foods are sources of fats?

    - Cooking oils, butter, meat, chicken, fish, ground nut oils and breastmilk are among the sources of fats.

7. Which type of fats are not healthy fats?

    - Saturated fats: Butter, meat fats and oils from animal sources are not good fats, because they have a high amount of saturated fats.

8. what are the basic classification of nutrients

    - Micronutrient
    - Macro nutrient
    - .

Self check 3

1. What is Anthropometry?

    - It is the measurement of the human body. The weight, the height and the mid upper arm circumference are the most commonly used.

2. List the three parts of nutrition guidelines

1. Nutrition strategies in emergency situations
2. Rapid nutrition surveys
3. Selective feeding programs

Self check4

5. List some example of Essential minerals.
    - Essential minerals include; calcium, iron, zinc, iodine and chromium
6. Describe the source of monounsaturated and polyunsaturated fats.
    a. Nuts, olives and avocados are sources of monounsaturated fats.
    b. Fish and seafood are primary sources of polyunsaturated fats.
    c. In addition, vegetable oils, such as canola, contain both monounsaturated and polyunsaturated fats.
7. What is the use of carbohydrate to our body.
    - Carbohydrates are necessary to supply your body with glucose, which is its primary source of energy.
8. What are the function of carbohydrate
    - Energy supply
    - Protein-sparing action
    - Helping the body use fat efficiently
    - Lactose enhances calcium absorption
    - As component of body substances and compounds
    - Encouraging growth of useful bacteria
    - Promoting normal functioning of the lower intestine
    - Improving the palatability of food/drink
    - Texture and preservative

LO#2

Self check #1

2. what are the effects of low maternal iron level for the baby and mother in pregnancy?
    - Babies will be born without three to six months iron supply
    - Breast milk may have insufficient iron.

3. Which parts of the body should you examine to find out whether a pregnant woman is anemic or not?
    - Lower eyelids, the inside of the lips and the palms which should be bright pink; if there is anaemia, all of these will be pale whitish.

Selfcheck #2

5 Identify factor that affect nutritional requirements
- Quality and Quantity the food they eat,
- The efficiency of their digestive system in absorbing and
- Utilizing eaten food and biochemical availability

6 Why we need to know nutritional requirements of an individual or group?
- **Prescriptive reasons:** that is, to provide or dispense food supplies; for example:
    - To procure food for national consumption
    - To secure food for institutional consumption
    - To run nutritional supplementation programs.
- **Diagnostic reasons:** mainly to identify whether a group or an individual is suffering from malnutrition of any kind; for example:
    - To evaluate nutritional intervention programs
    - To determine whether the food available in the stock is adequate to feed the household or nation for a certain duration of time.
    - In order to estimate nutritional requirements of individuals or groups, we need to consider the following factors:
        - Physical activity — whether a person is engaged in heavy physical activity
        - The age and sex of the individual or group
        - Body size and composition — what the general build is of a person or group
        - Climate — whether a person or group is living in hot or cold climate
        - Physiological states, such as pregnancy and lactation.

Self-Check 3

. 1. What is **Balanced diet?**

- Balanced diet is a diet that contains an adequate quantity of the nutrients that we require in a day. A balanced diet includes six main nutrients, i.e. Fats, Protein, Carbohydrates, Fiber, Vitamins, and Minerals.

2. Carbohydrates can be found in

a. rice c. bread

b. wheat **d. all**

self check 4

4. List the four major forms of malnutrition in Ethiopia;
   - Acute and
   - Chronic malnutrition,
   - Iron deficiency anaemia (IDA), vitamin A deficiency (VAD), and
   - Iodine deficiency disorder (IDD).
5. What are the three classification of sever acute malnutrition?
   - **Marasmus**: Severe form of acute malnutrition that is characterized by wasting of body tissues.
     - ✓ Marasmic children are extremely thin.
   - **Kwashiorkor**: Severe form of acute malnutrition characterized by bilateral edema and weight-for-height of greater or equal to -2 SD
   - **Marasmic-Kwashiorkor**: Severe form of acute malnutrition characterized by bilateral edema and weight-for-height of less than -2 SD.
6. Write the consequence of malnutrition;
   - **Increased risk of disease and death**
   - **Low productivity of the malnourished individuals**
   - **Poor school performance and attendance**
   - **Poverty perpetuation (a vicious circle)**
   - **Iodine deficiency**

LO#3

Self check#1

To perform bottle cleaning follow this procedure

1. Put all parts of the cleaned bottle, including teats, in a large saucepan.

2. Cover the equipment with tap water.
3. Make sure all air bubbles are out of the bottles and that they are fully submerged under the water.
4. Bring the water to the boil.
5. Boil for 5 minutes.
6. Let the feeding equipment cool in the saucepan before taking it out.
7. Place all the feeding equipment in a clean container and put it in the fridge. Make sure the container is covered firmly with a lid.
8. You can store everything in the fridge for up to 24 hours.

Self check #2

Operation sheet 2- techniques of Preparing a feed using Powdered Infant Formula:

i. Clean and disinfect a surface on which to prepare the feed.
ii. Wash hands with soap and water, and dry using a clean cloth or a single-use napkin.
iii. Boil a sufficient volume of safe water. If using an automatic kettle, wait until the kettle switches off; otherwise make sure that the water comes to a rolling boil. Note: bottled water is not sterile and must be boiled before use. Microwave ovens should never be used in the preparation of PIF as uneven heating may result in 'hot spots' that can scald the infant's mouth.
iv. Taking care to avoid scalds, pour the appropriate amount of boiled water, which has been allowed to cool slightly, but not below 70 °C, into a cleaned and sterilized feeding cup or bottle. The temperature of the water should be checked using a sterile thermometer.

a. If making a batch in a larger container: the container should have been cleaned and sterilized. It should be no larger than 1 litre, be made from food-grade material and be suitable for pouring hot liquids.

v. To the water, add the exact amount of formula as instructed on the label. Adding more or less powder than instructed could make infants ill.

a. If using feeding bottles: assemble the cleaned and sterilized parts of the bottle according to the manufacturer's instructions. Shake or swirl gently until the contents are mixed thoroughly, taking care to avoid scalds.

b. If using feeding cups: mix thoroughly by stirring with a cleaned and sterilized spoon, taking care to avoid scalds.

c. If preparing a batch in a larger container: stir formula using a cleaned and sterilized spoon to ensure even mixing. Immediately pour into individual feeding cups or bottles, taking care to avoid scalds.

vi. Cool feeds quickly to feeding temperature by holding under a running tap, or placing in a container of cold water or iced water. Ensure that the level of the cooling water is below the top of the feeding cup or the lid of the bottle.

vii. Dry the outside of the feeding cup or bottle with a clean or disposable cloth and label with appropriate information, such as type of formula, infant's name or ID, time and date prepared, and preparer's name.

viii. Because very hot water has been used to prepare the feed, it is essential that the feeding temperature is checked before feeding in order to avoid scalding the infant's mouth. If necessary, continue cooling as outlined in step Vi above. Discard any feed that has not been consumed within two hours.

Self check#3

2. List some constituents of breastmilk

- Water = 87–89%
- Vitamins (particularly vitamin A)
- Fat = 3–5%
- Energy = 60–70 kcal/100 ml
- Carbohydrate (lactose) = 6.9–7.2%
- Mineral = 0.2%
- Protein = 0.8–0.9%

3. What are the key messages to optimal breast feeding?

- Initiate breast feeding within one hour of birth
- Breast feed the child frequently day and night
- Exclusive breast feeding for the first 6 months of age
- Continue breast feeding more frequently even when the child is sick
- Position and attach infant correctly at the breast
- Offer the second breast after the infant releases the first
- The mother should eat more than usual

Self check 4

1. **Tips of child feeding**
   - When starting solid foods, give your baby 1 new food at a time. Don’t use mixtures like cereal and fruit or meat dinners. Give the new food for 2 to 3 days before adding another new food. This way you can tell what foods your baby may be allergic to or can't handle.
   - Start with small amounts of new solid foods. Try a teaspoon at first and slowly increase to a tablespoon.
   - There are no strict rules about what order you should give different foods in. Many people start with an infant cereal and slowly add fruits, vegetables, and proteins.
   - Don't use salt or sugar when making homemade baby foods. Canned foods may contain large amounts of salt and sugar and shouldn't be used for baby food.
   - Don’t feed homemade spinach, beets, green beans, squash, or carrots to babies younger than age 6 months. These foods can have high amounts of nitrates. This raises the risk for a blood disorder (methemoglobinemia) that can interfere with oxygen delivery in the blood.
   - Always wash and peel fruits and vegetables and remove seeds or pits. Take special care with fruits and vegetables that come into contact with the ground. They may contain botulism spores that cause food poisoning.
   - Cow's milk shouldn't be added to the diet until your baby is age 12 months. Cow's milk doesn't provide the right nutrients for your baby.
   - Fruit juice without sugar can be started when your baby is able to drink from a cup (around age 6 months or older). But, it's not a necessary part of a healthy infant’s diet and should be limited to a maximum of 4 to 6 ounces daily. Fruit juice is linked to both obesity and malnutrition in children. Whole fruits and vegetables are a much healthier option.
   - Feed all foods with a spoon. Your baby needs to learn to eat from a spoon. Don't use an infant feeder. Only formula and water should go into the bottle.
   - Avoid honey in any form for the first year because it can cause a type of botulism.
   - Don't put your baby in bed with a bottle propped in his or her mouth. Propping the bottle is linked to ear infections and choking. Once your baby's teeth are present, propping the bottle can cause tooth decay.

- Your baby's healthcare provider can advise you on how to wean your baby off the bottle.
- Avoid the clean plate syndrome. Forcing your child to eat all the food on his or her plate even when he or she isn't hungry isn't a good habit. It teaches your child to eat just because the food is there, not because he or she is hungry. Expect a smaller and pickier appetite as your baby's growth rate slows around age 1.
- Healthy babies usually need little or no extra water. Ask your child's healthcare provider about giving your baby additional fluids throughout the day. Once your child is taking solids, offering sips of water is usually fine.
- Don't limit your baby's food choices to the ones you like. Offering a wide variety of foods early can help lead to good eating habits later.
- Fat and cholesterol shouldn't be limited in the diets of babies and very young children, unless advised by your baby's healthcare provider. Children need calories, fat, and cholesterol for healthy growth.

2. Identify the four sign of good attachments;
    - More of the areola is visible above the baby's top lip than below the lower lip;
    - The baby's mouth is wide open;
    - The baby's lower lip is curled outwards;
    - The baby's chin is touching or almost touching the breast.

Selfcheck #5

1. Describe the advantages of initiation of breast feeding.

Initiating breastfeeding within one hour protects the infant from disease by providing the thick, yellowish first milk (colostrum) which is the equivalent to the infant's first vaccine. It also helps to expel the placenta more rapidly and reduces blood loss by the mother. It also helps expel meconium (the infant's first stool), stimulates further breastmilk production and keeps the newborn warm through skin-to-skin contact. The Baby-friendly Hospital Initiative (BFHI) assessment tool suggests that the baby should be placed "skin-to-skin" with the mother within the first half-hour following delivery. Within the first hour, assistance with positioning and attachment should be given, or if the mother has had a caesarean section, within an hour of when she is able to respond.Often, mothers who have undergone caesarean section need extra

help with breastfeeding. Otherwise, these mothers on average initiate breastfeeding much later and terminate breastfeeding sooner. Optimally, the baby should be breastfed any routine procedure (such as bathing, weighing, umbilical cord care, administration of eye medications) is performed. Early breastfeeding enhances bonding, increases chances of breastfeeding success, and generally lengthens the duration of breastfeeding.

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