Federal Democratic Republic of Ethiopia
Ministry of Health

Nutrition

Blended Learning Module for the Health Extension Programme

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Ministry of Health

The Ethiopian Federal Ministry of Health (FMOH) and the Regional Health Bureaus (RHBs) have developed this innovative Blended Learning Programme in partnership with the HEAT Team from The Open University UK and a range of medical experts and health science specialists within Ethiopia. Together, we are producing 13 Modules to upgrade the theoretical knowledge of the country's 33,000 rural Health Extension Workers to that of Health Extension Practitioners, and to train new entrants to the service. Every student learning from these Modules is supported by a Tutor and a series of Practical Training Mentors who deliver the parallel Practical Skills Training Programme. This blended approach to workplace learning ensures that students achieve all the required theoretical and practical competencies while they continue to provide health services for their communities.

These Blended Learning Modules cover the full range of health promotion, disease prevention, basic management and essential treatment protocols to improve and protect the health of rural communities in Ethiopia. A strong focus is on enabling Ethiopia to meet the Millennium Development Goals to reduce maternal mortality by three-quarters and under-5 child mortality by two-thirds by the year 2015. The Modules cover antenatal care, labour and delivery, postnatal care, the integrated management of newborn and childhood illness, communicable diseases (including HIV/AIDS, malaria, TB, leprosy and other common infectious diseases), family planning, adolescent and youth reproductive health, nutrition and food safety, hygiene and environmental health, non-communicable diseases, health education and community mobilisation, and health planning and professional ethics.

In time, all the Modules will be accessible from the Ethiopian Federal Ministry of Health website at **www.moh.gov.et**; online versions will also be available to download from the HEAT (Health Education and Training) website at **www.open.ac.uk/africa/heat** as open educational resources, free to other countries across Africa and anywhere in the world to download and adapt for their own training programmes.

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The opinions expressed in this Module are those of the authors and do not necessarily reflect the views of any of the donor organisations whose generous support made the production of *Nutrition* possible.

Contents

Study Session	
1	Food, Diet and Nutrition: an Overview
2	Nutrients and their Sources
3	Nutritional Requirements throughout the Lifecycle
4	Infant and Young Child Feeding
5	Nutritional Assessment
6	Common Nutritional Problems in Ethiopia
7	Preventing Micronutrient Problems in Ethiopia
8	Household Food Security
9	Managing Acute Malnutrition
10	Managing Severe Acute Malnutrition
11	Nutrition Education and Counselling
12	Nutrition and HIV
13	Nutrition Information System
	Notes on the Self-Assessment Questions (SAQs)

Introduction to the *Nutrition* Module

The national health strategy of Ethiopia emphasises the provision of effective health promotion and disease prevention services at the community level. The first Millennium Development Goal (MDG1) calls for the eradication of extreme poverty and hunger by 2015. Achievement of MDG1 is crucial for national socioeconomic progress and development. For this purpose, Ethiopia has developed a National Nutrition Strategy (NNS) and launched a National Nutrition Programme (NNP) in 2008. The vision of the NNS/NNP is

> *'to ensure that all Ethiopians secure adequate nutritional status in a sustainable manner which is an essential requirement for a healthy and productive life'.*

The NNP, working hand in hand with the successful Health Extension Programme (HEP), has the potential to bring about major change to the status of health and nutrition in Ethiopia.

The *Nutrition* Module is studied in parallel with a Practical Skills Training Programme at health facilities in your locality. This blended approach to learning will ensure that you achieve all the theoretical and practical competencies required to give effective nutritional care and support in your community.

The *Nutrition* Module has 13 study sessions, starting with the basics of nutrition and finishing with a session on the Nutrition Information System in Ethiopia. The first three Study Sessions cover food, diet and nutrition; nutrients and their food sources (in Ethiopia); and nutritional requirements throughout the human lifecycle. Study Session 4 deals with infant and young child feeding in the context of our country. Following this, you will learn different methods of nutritional assessment (Study Session 5) both at individual and community level. In Study Sessions 6 and 7, the nutritional problems that are of public health importance in Ethiopia are elaborated; followed by household food security (Study Session 8). Study Sessions 9 and 10 cover the treatment and control of the main nutritional problems of Ethiopia, including severe micronutrient malnutrition. In Study Session 11 you will learn about education and how to counsel people in your community to prevent or address nutrition problems. Nutrition and HIV is considered in Study Session 12. Finally, in Study Session 13 you look at the Nutrition Information System in Ethiopia and your role in collecting data that helps to inform decision-making in relation to nutrition programmes and other interventions in Ethiopia.

Study Session 1 Food, Diet and Nutrition: an Overview

Introduction

In this study session, you will learn about some of the basics of nutrition. You will learn what is meant by food and diet as well as the meaning of nutrition and nutrients in general. What food does to our body and how the body uses nutrients is also explained. Estimates of the eligible population for nutritional care and support are provided, using calculations from the Ethiopian census data. Finally, the relationship between health, nutrition and development is described, linking them with the Millennium Development Goals. The overall purpose of this session is to teach you some of the basics about nutrition that you will be able to use in your work and will inform your learning throughout the whole of the Module.

Learning Outcomes for Study Session 1

When you have studied this session, you should be able to:

1.1 Define and use correctly all of the key words printed in **bold**. (SAQs 1.1 and 1.2)

1.2 Know how to estimate the number of children under two and under five years of age, as well as pregnant and lactating mothers in your community in one year. (SAQ 1.3)

1.3 Briefly describe the differences and relationships between food, diet and nutrients. (SAQs 1.1 and 1.2)

1.4 Understand how food nourishes the body. (SAQs 1.2 and 1.4)

1.5 Explain the relationship between nutrition and health, and nutrition and development. (SAQs 1.4 and 1.5)

1.1 Maternal and childhood undernutrition

The first Millennium Development Goal (MDG 1) calls for the eradication of extreme poverty and hunger, and its achievement is crucial for national progress and development. All the Millennium Development Goals are connected so failing to achieve this goal jeopardises the achievement of other MDGs, including goals to achieve universal primary education (MDG 2), reduce child mortality (MDG 4) and improve maternal health (MDG 5).

One of the indicators used to assess progress towards MDG 1 is the prevalence of children under five years old who are **underweight**, or whose weight is less than it should be for their age. To have adequate and regular weight gain, children need enough good-quality food to meet their nutritional requirements, they need to stay healthy and they need sufficient care from their families and communities.

To a great extent, achieving the MDG target on underweight in children depends on the effective implementation of large-scale nutrition and health programmes that will provide appropriate food, health and care for all children in a country. Your role as a Health Extension Practitioner is, therefore, key in attaining these goals.

1.1.1 The global burden of childhood and maternal undernutrition

More than 50% of all deaths in children under five are caused by undernutrition.

Undernutrition contributes to more than 50% of all deaths in children under the age of five. It does this by impacting on children's strength and making illness more dangerous. An undernourished child struggles to withstand an attack of pneumonia, diarrhoea or other illness — and illness often prevails. Undernutrition is caused by poor feeding and care, aggravated by illness. The children who survive may become locked in a cycle of recurring illness and slow growth, diminishing their physical health, irreversibly damaging their development and their cognitive abilities, and impairing their capacities as adults. If a child suffers from diarrhoea — due to a lack of clean water or adequate sanitation, or because of poor hygiene practices — it will drain nutrients from his or her body.

Chronic undernutrition (meaning low height for age, also known as **stunting**) in early childhood also results in diminished mental and physical development, which puts children at a disadvantage for the rest of their lives. They may perform poorly in school, and as adults they may be less productive, earn less and face a higher risk of disease than adults who were not undernourished as children. For girls, chronic undernutrition in early life, either before birth or during early childhood, can later lead to their babies being born with **low birth weight**, which can again lead to undernutrition as these babies grow older. Thus a vicious cycle of undernutrition repeats itself, generation after generation.

The global burden of stunting is far greater than the burden of underweight. Based on the latest available data, in the developing world, the number of children under five years old who are stunted is close to 200 million, while the number of children under five who are underweight is about 130 million.

Infants with low birth weight may never recover from their early disadvantage. Like other undernourished children, they may be susceptible to infectious disease and death, and as adults they may face a higher risk of chronic illness such as heart disease and diabetes. Thus the health of the child is inextricably linked to the health of the mother. In turn, the health of the mother is linked to the status a woman has in the society in which she lives. In many developing countries, the low status of women is considered to be one of the primary reasons for undernutrition across the life cycle.

1.1.2 Childhood and maternal malnutrition in Ethiopia

Malnutrition is one of the main health problems facing many women and children in Ethiopia. Ethiopia 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). The 2005 Ethiopian Demographic and Health Survey (DHS) highlights the different levels of deficiencies in different age groups (see Table 1.1).

Vitamin A deficiency is the most common cause of preventable blindness. The 2005 national IDD survey showed a goitre (enlargement of the thyroid gland in the front of the neck) of over 35%; both of these are considered emergency proportions by WHO standards. There is a marked decrease in the number of Ethiopian households that consume iodised salt compared with a decade ago, leading to increased iodine deficiency disorder.

The prevalence of low birth weight (LBW) in Ethiopia (14%) is one of the highest in the world. One major contributing factor for LBW is the poor nutritional status of women both before and during pregnancy, made even worse by inadequate weight gain during pregnancy.

Table 1.1 Nutritional indicators for Ethiopia. Source: 2005 Ethiopian Demographic and Health Survey (DHS)

Type of nutritional problem	Rate
Children under-five who were:	
Stunted	47%
Wasted	11%
Underweight	38 %
Women (15–49 years) who were:	
Chronically malnourished (body mass index [BMI] less than 18.5)	27%
Vitamin A deficiency:	
Children from 6–59 months old	61%
Iodine deficiency:	
Goitre (IDD)	
children with goitre	39.9%
mothers with goitre	35.8%
Ethiopian households consuming iodised salt	4.2%
Iron deficiency anaemia:	
Children age 6–59 months	54%
Women age 15–49	27%
Low birth weight (LBW)	14%

BMI is weight in kg divided by height in cm.

The consequences of malnutrition for Ethiopia if no action is taken are enormous. The greatest functional consequences of malnutrition for children are increased risk of illness, and death; and for those who survive, mental impairment and reduced capacity to produce and contribute to the economy of the country. These consequences of malnutrition are often not fully appreciated because they are hidden. Based on a national study, malnutrition contributes to an estimated 270,000 deaths of under-five children each year; and VAD contributes to 80,000 children's lives lost every year. As malnutrition and VAD weaken the immune system of children, they will be susceptible to common childhood infections and more liable to suffer from serious complications.

Malnutrition impacts on health, mental development, and work productivity.

Beyond the individual human suffering, malnutrition reduces mental development and, thus, will mean slower learning throughout life. About 685,000 babies are born to mothers with IDD and are likely to suffer from some degree of reduced mental capacity. Malnutrition also reduces work productivity, as stunted, less educated and mentally impaired adults are less productive. It has been estimated that the annual value of the loss in productivity that can be attributed to child stunting is 2.92 billion ETB (Ethiopian Birr). Moreover, iodine deficiency, which results in irreversible

impairment of intellectual capacities, has been estimated to cost the Ethiopian economy 1.35 billion ETB per year. The productivity losses due to malnutrition in Ethiopia over the next ten years will be 144 billion ETB.

When aggregated, the effects on illness, education and productivity have an enormous impact on the economic growth and poverty reduction effort of the country. Given the benefits of reducing the burden of malnutrition in Ethiopia, the government efforts to address malnutrition in a comprehensive approach can be easily justified.

- What are the major nutritional problems in Ethiopia?
  - Acute and chronic undernutrition, vitamin A deficiency, iodine deficiency disorders, and iron deficiency are the major problems in Ethiopia.
- What are the consequences of different types of malnutrition?
  - The consequences of malnutrition (undernutrition) for children are illness and death. For those who survive, many have mental impairment and reduced capacity to produce and contribute to the economy. Malnutrition reduces mental development and, thus, will mean slower learning throughout life. Iodine deficiency results in irreversible impairment of intellectual capacities. Vitamin A deficiency, if untreated, can lead to blindness.
- Why is chronic undernutrition a serious problem for developing countries?
  - Malnutrition reduces work productivity, as stunted, less educated and mentally impaired adults are less productive. For example, time is lost to economic activities in looking after sick children and days are lost from school. This will have a negative impact on economic growth and poverty reduction efforts of developing countries.

The most critical time for preventing malnutrition is during pregnancy and the first two years of a child's life. You will look at how you can plan nutritional support for mothers and babies in your community in the next section.

1.2 Planning nutritional care and support in your community

When you are planning nutritional care and support in your community, the first step is to calculate the number of children under five, and the number of pregnant and lactating women who might need nutritional care and support in one year. According to the 2007 population statistics of Ethiopia, the number of children under two years is calculated as 8% of the total population, while the number of children under five years of age is 14.6%. The Ethiopian population statistics also indicate that the number of pregnant women is 4% of the general population. This percentage is used to estimate the number of pregnant and lactating mothers in a given community. The percentages will vary to some extent between communities, but they can be used to estimate numbers with reasonable accuracy. Look at Box 1.1 which illustrates how to calculate the number of children under the age of 2 years in a *kebele*.

Box 1.1 Calculating the number eligible for nutritional care and support in a *kebele*

The percentage of children under the age of two years in a *kebele* of 5000 people is calculated as follows:

$$\text{Children under two} = \frac{\text{total population} \times 8}{100}$$
$$= \frac{5000 \times 8}{100}$$
$$= 400$$

- How many children under five and how many pregnant women are there in the *kebele*?

□ You calculate the number of children under five years as follows: 5000 × 14.6 ÷ 100 = 730 children under five; the number of pregnant women would be 5000 × 4 ÷ 100 = 200 in total.

Activity 1.1 Planning nutritional care and support

How many children under two or under five and how many pregnant and lactating mothers are there in your *kebele*? Make a note of your answers in your Study Diary to share with your Tutor at your Study Support Meeting.

Answer

We do not know the numbers of your *kebele* but if you use the example above to help you do your calculation, you will now be able to plan nutrition care and support for children and mothers in the community.

1.3 Food, diet and nutrition

What we eat and drink to help keep us alive and well, to help us grow, develop, work and play is called food. **Food** is anything edible. It includes all foods and drinks acceptable for that particular society, culture or religion.

Food gives us a feeling of comfort and satisfaction. Eating certain foods establishes our identity. What we eat and how we eat makes up our food habit. Most of our food habits are learned in the home from our parents. As we grow up, our experience and learning help us to change some of these food habits. You are learning about food and nutrition in order to be able to teach and help mothers to change their food habits for the better.

Diet is the sequence and balance of meals in a day. It is concerned with the eating patterns of individuals or a group. Some people may eat twice in a day (breakfast and dinner); others may eat four times (breakfast, lunch, snack and dinner); still others may seem to be chewing all day long.

Nutrition is the interaction between food and the body. It is about the **nutrients** contained in food, and their action, interaction and balance in relation to health and disease. It is the process by which people can ingest, digest, absorb, transport, utilise and excrete food substances. In addition,

nutrition is concerned with social, cultural and physiological implications of food and eating. In general, the science of nutrition is the science of showing how food nourishes the body.

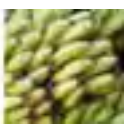
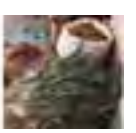
A **nutrient** is an active chemical component in food that plays a specific structural or functional role in the body's activity. Sugars, starches and fibre are often grouped together as they are all **carbohydrates**. Vitamins and minerals are needed in very small amounts and they are called **micronutrients**.

Almost all foods are a mixture of nutrients. They contain different amounts of sugar, starch, fibre, fat, protein, minerals, vitamins and water. Table 1.2 shows you the different nutrients, their food groups and examples of food sources found in Ethiopia.

- Think of some of the food types usually consumed in your community. What nutrients do these foods have and what nutrient do you think they might lack?

- Examples of food types you might have listed include '*teff*' or maize, which mainly provide carbohydrates; peas and beans, which provide protein; '*gommen*' which is good source of vitamin A and iron and oranges, which provide vitamins. These foods do not have everything so they need to mix them to get all the nutrients we need. The different types of nutrients that each person's body needs are shown in Table 1.2.

Table 1.2 Types of nutrients and their food sources. (Photos: Dr Basiro Davey)

Nutrient	Food group	Examples of foods
Sugar Starch Fibre	Carbohydrates	 
FatsOils	Fats	 
Proteins	Proteins	 
Vitamins Minerals	Micronutrients	 
Water	Water	

1.3.1 How food keeps us healthy

Food is needed for energy and nutrients to exist, it provides energy for work, and warmth for the body. Everybody also needs food to build, maintain and repair their body. It is also required for control of body processes and for protection against disease and infections. By performing these functions, food helps us to keep healthy, warm, well-nourished, free of infections and alive.

By helping us to understand how food and nutrients work, the science of nutrition plays a fundamental role in the promotion of health, in the prevention of illness and in the restoration of health following illness or injury. Your work as a Health Extension Practitioner can be instrumental in preventing problems related to nutrition.

1.3.2 What does food do for our body?

As you just read, food contains chemical substances called nutrients and these are found in varying amounts and combinations in different foods. Nutrients are the part of food which the body uses to:

- build tissues
- produce energy
- keep healthy.

Enough food containing the necessary nutrients should be eaten every day (such as carbohydrates, proteins, water, vitamins and minerals). It is likely that you will get enough of the other nutrients (for example dietary fibre) that your body needs by doing this. No one food supplies all the nutrients the body needs. No one nutrient is more important than the others. Each nutrient does specific jobs. The nutrients work together to keep us healthy.

It is important to include **fibre** (roughage) in the diet because it makes the bowels work properly and provides bulk to make us feel full. Fresh fruits and vegetables, peas and beans, whole wheat flour and unrefined maize or sorghum flour give us fibre.

In the next two sections, you will learn why and how the body uses nutrients to build the body and produce energy.

1.4 The importance of nutrients

The nutrients we get from the food we eat will affect the size and shape of our body. The use of nutrients to build tissues and supply energy at various stages of our life is explained here.

1.4.1 Using nutrients to build tissue

The human body consists of different types of nutrients. For example, a person who weighs 50 kg consists of 31 kilograms of water, 9 kg of protein, 7 kg of fat and 3 kg of minerals. Therefore, besides water, the most important building nutrient is protein. Fat is also important to build cells and energy stores. Some minerals are important, for example calcium, which is necessary to build bones and teeth, and iron which helps to build haemoglobin in the blood. Table 1.3 shows the percentages of each of the nutrients in the body.

Table 1.3 Nutrient content of the human body.

Nutrient	%
Minerals	6%
Fat	14%
Protein	18%
Water	62%

■ How does the body use nutrients? Give examples of foods for each type of nutrient based on your experience of your community.

□ The body uses nutrients to:

- build the body, produce fluids and repair tissues; for example, proteins such as meat, eggs, fish, milk
- produce energy so that the body can keep alive and warm and so it can move and grow; for example, carbohydrates such as '*teff*', bread, sugar and pasta
- protect the body from disease; for example, vitamins and minerals such as '*gommen*', oranges, carrots and bananas
- help chemical processes.

1.4.2 Using nutrients to build the body

For growth: A child starts to grow as a single cell inside its mother. The cell absorbs nutrients; it grows and divides into two cells. The cell uses nutrients as building materials for the new cell and other nutrients for energy to do the work of building. Each cell then absorbs more nutrients to grow larger and divide again. The cells continue to absorb nutrients and to grow and divide until there are millions of cells which form different tissues such as skin, muscle and bone. The child's body also makes fluids such as blood, which nourishes and protects the cells.

For pregnancy: During pregnancy, a woman needs body building nutrients to:

- provide the baby and placenta with nutrients to grow
- increase the size of her uterus and breasts
- make more blood and stores of fat that can be mobilised during lactation, and other nutrients.

To secrete fluids: The body has to keep making fluids such as saliva, digestive juices, tears and breastmilk because they are continually used up.

To replace cells: Most cells live only a short time. The body must build new cells to replace those that die. The need to replace cells continues throughout life. Skin is a good example. The outside layer of the skin is already dead. All the time new cells are growing under the dead cells to replace them. When you wash and dry yourself, you remove the dead cells.

If you wear shoes for a long time you get holes in the soles. But if you walk without shoes, you do not get holes in your feet, because new skin cells grow under the old cells to replace them.

To repair tissues: After injury or illness, the body makes new cells to repair the damaged tissues.

■ How do nutrients help body building during pregnancy and childhood?

□ During pregnancy, nutrients:

- provide the baby and placenta with nutrients to grow
- increase the size of the mother's uterus and breasts
- make more blood and stores of fat that can be mobilised during lactation, and other nutrients.

During childhood, a child needs nutrients:

- to grow larger and form different tissues such as skin, muscle, bone, and the brain
- so their body is able to make fluids such as blood, which nourishes and protects the cells.

1.4.3 Using nutrients to produce energy

When you turn on the engine of a car, the petrol combines with oxygen and 'burns' to make energy. The energy makes the car move, and it also makes the engine warm. Similarly, the body 'burns' nutrients to make energy. Sometime people are surprised to learn that nutrients are 'burning' inside their bodies. Nutrients do really burn – but in a different way from a fire so that there is no fire or smoke.

Starch, sugar and fat are made of the elements carbon, hydrogen and oxygen. When they 'burn' in the cells, they combine with oxygen from the air that we breathe in. They release energy, and they change into carbon dioxide and water, which we breathe out. Table 1.4 shows the different ways our body uses energy.

Table 1.4 Different uses of carbohydrates in our body.

Function	Reason
To keep alive	Our bodies are 'turned' on and use energy from the moment of conception until we die. For example, energy is used to keep the heart and kidneys working.
To keep warm	Our bodies are warm, even if we are asleep. Keeping warm uses energy.
To build tissues	The body uses nutrients such as starch to provide the energy for building.
To secrete fluids	The body uses energy to secrete fluids such as saliva and breastmilk.
To repair tissues	After injury or illness, the body uses energy to repair damaged tissues.
To move and work	We need energy to move muscles, to move our bodies, to walk, to talk, to play, to run and to work.

■ List some of the ways the body uses nutrients to produce energy. Which population group in your community needs the most energy and why?

□ The body uses nutrients to produce energy to keep alive, build and repair tissues, secrete fluids, keep warm, move and work. The population group that needs a lot of energy is children because they are very active (they run and play a lot) and their energy needs, based on their body weight are high.

Table 1.5 below provides you with a summary of the way our body uses nutrients.

Table 1.5 How the body uses nutrients in food we eat.

Nutrient	Use
Carbohydrates (starches and sugars)	For energy
Fibre	To keep gut healthy To help digestion
Fats	For energy To build cells Stored for use as energy when needed
Proteins	To build cells To make fluids For chemical processes For energy To protect against infection
Minerals	To build cells To make fluids For chemical processes
Vitamins	For chemical processes To build cells To protect against infection
Water	For chemical processes For building cells To make fluids

1.5 Food and nutrition: cultural and religious taboos

Within all communities there are often stories and a rich heritage of beliefs and customs around the subject of food. Sometimes, however, these cultural features become the cause of problems. Within Ethiopian society some problems have been identified including:

- Pregnancy — women do not receive enough care; the work burden of the mothers is not alleviated.
- Breastfeeding — colostrum discarded; the newborn is forced to swallow butter.
- Infancy/childhood — children eat last; the quality of their food is poor.
- Women — gender bias; women eat last and only have the leftovers.

■ Can you think of beliefs or customs around food and nutrition in your own community that might cause difficulties for particular groups?

□ One example is that for some communities it is taboo for the mother to eat meat and eggs while she is pregnant, because it is believed that she will have a big baby which will cause problems during delivery. Another belief is that pregnant mothers should not consume milk because the baby will have a whitish covering over its head when it is born. You may have many other examples, which you can discuss with your Tutor.

1.6 Nutrition, health and development

You have probably heard the saying 'You are what you eat'. The health of your body depends on what you feed it on, just as a healthy plant or anything else will grow better in rich soil and good conditions. As you have learnt in this study session, everybody needs a variety of foods which contain enough different nutrients to keep them alive and healthy. This means that nutrition is a foundation for health and development. Better nutrition means stronger immune systems, less illness and better health for people of all ages. Healthy children learn better and grow better. Healthy people are stronger, more productive, and better able to break cycles of poverty and realise their full potential. The relationship between nutrition, health and development is best described using the MDGs.

Table 1.6 The relationship between nutrition, health and development, and the MDGs.

MDG goals	Relevance of nutrition
MDG 1: Eradicate extreme poverty and hunger	Contributes to human capacity and productivity throughout life cycle and across generations.
MDG 2: Achieve universal primary education	Undernutrition can lead to frequent illness and absence from school, which can impact on attainment. A good diet improves readiness to learn and improves school achievement. Iron deficiency disorder reduces mental capacity and academic achievement of children. Iron deficiency anaemia affects energy levels as well as school attendance and performance.
MDG 3: Promote gender equity and empower women	Empowers women. By promoting caring for women (e.g. women should not have to eat after men) and reducing a woman's household work, the burden of women will be shared and this increases access to, and availability of, affordable food (household food security).
MDG 4: Reduce child mortality	Reduces child mortality. Over half of childhood deaths are attributable to malnutrition. Micronutrients are needed for proper functioning of the immune system. Proper levels of vitamin A also will reduce child mortality by 23%. Childhood morbidities are compounded by iron, zinc and other nutrient deficiencies, leading to increased death rates.
MDG 5: Improve maternal health	Contributes to maternal health through many pathways. Addresses gender inequalities in food, care and health.

MDG 6: Combat HIV/AIDS, malaria and other diseases	Slows onset and progression of AIDS. Treatment and care are important components.
MDG 7: Ensure environmental sustainability	Highlights the importance of local crops for diet diversity and quality. Nutrition depends on a good environment as this is important for the processes of food production up to its consumption. The availability of some nutrients (for example iodine) depends on a well-maintained environment.
MDG 8: Develop a global partnership for development	Brings together many sectors around a common problem.

In this study session you have learnt about the magnitude of nutritional problems in Ethiopia. In addition, you have gained some knowledge about the basics of nutrition that you will use in your work. The summary below will enable you to remember the main points.

Summary of Study Session 1

In Study Session 1, you have learned that:

1 Ethiopia is affected by a high level of undernutrition (acute and chronic malnutrition).

2 Vitamin and mineral deficiencies (vitamin A, iodine and iron) affect a huge proportion of children and mothers. The health and economic consequences are immense for the country.

3 The body uses different nutrients for different reasons, such as an energy source, to build cells, make fluids and protect against infection.

4 It is necessary to calculate the number of children under two or under five and pregnant mothers in your *kebele* who might need nutritional care and support.

5 There are community customs and traditional beliefs that impact on feeding habits and may not always promote best nutritional outcomes, particularly for women and children.

6 Good nutrition has positive outcomes for the health and development of the population. Health Extension Practitioners have an important role to play in providing information about nutrition to families in their communities.

Self-Assessment Questions (SAQs) for Study Session 1

Now that you have completed this study session, you can assess how well you have achieved its Learning Outcomes by answering the questions below. Write your answers in your Study Diary and discuss them with your Tutor at the next Study Support Meeting. You can check your answers with the Notes on the Self-Assessment Questions at the end of this Module.

SAQ 1.1 (tests Learning Outcomes 1.1 and 1.3)

In the text you are told that children in many communities in Ethiopia suffer from malnutrition. Can you name the different kinds of malnutrition and then describe the signs that might tell you that childhood malnutrition is a problem in your community?

SAQ 1.2 (tests Learning Outcomes 1.1, 1.3 and 1.4)

Mrs Y's children are underweight but she tells you that they are eating lots of food. However you know that this is mainly carbohydrates. How can you persuade her that the family needs to eat many different kinds of food?

SAQ 1.3 (tests Learning Outcome 1.2)

Afeta is a *kebele* in Jimma Zone, Oromia Regional State. It has a total population of 4800 people. Calculate the number of children under two and under five years old; then calculate the number of pregnant women in Afeta *kebele* who might need nutritional care and support.

SAQ 1.4 (tests Learning Outcomes 1.4 and 1.5)

Mrs X tells you that her family expects her to carry on working hard, with little food, even though she is seven months pregnant. She wants to persuade her family to let her rest and eat more. What advice would you give her?

SAQ 1.5 (tests Learning Outcome 1.5)

How can improving the food people eat contribute to some of the Millennium Development Goals?

Study Session 2 Nutrients and their Sources

Introduction

In the previous session 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 study 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.

Learning Outcomes for Study Session 2

When you have studied this session, you should be able to:

2.1 Define and use correctly all of the key words printed in **bold**. (SAQ 2.1)

2.2 Classify foods into groups according to their nutrients and differentiate between macronutrients and micronutrients. (SAQ 2.1)

2.3 List the sources and functions of the nutrients. (SAQs 2.1 and 2.3)

2.4 Describe vitamins and their classification. (SAQ 2.2)

2.5 Explain the functions of the common minerals that people require in their diet. (SAQ 2.2)

2.6 Describe a balanced diet for people in your community. (SAQ 2.3)

2.1 Classification of essential nutrients

Based on the amount of the nutrients that each person needs to consume on a daily basis, these nutrients are categorised into two 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. 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.

Metabolism means the process involved in the generation of energy and all the 'building blocks' required to maintain the body and its functions.

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 (see Box 2.1).

Box 2.1 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 breastmilk.

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

2.2 Macronutrients in detail

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

2.2.1 Carbohydrates

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.

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.

2.2.2 Classification of carbohydrates

Based on the number of **sugar units**, carbohydrates are classified into three groups; these are monosaccharides, disaccharides and polysaccharides. You need to know the classes of carbohydrates to enable you to give relevant advice to patients with special needs like **diabetes** (when someone has problems regulating the amounts of glucose in their body).

Monosaccharides and disaccharides are referred to as **simple sugars** or **simple carbohydrates** that our body can easily utilise. For this reason, people with diabetes mellitus shouldn't eat too many of these carbohydrates. Examples include sugar, honey, sweet fruits and sugar cane. Polysaccharides are called **complex carbohydrates** and they need to be broken down into simple sugars to be used by our body. They can be consumed by diabetic patients without restriction. Examples include starch and cellulose.

■ Can you think of examples of foods that are sources of carbohydrate?

□ Bread, '*teff*', maize, '*kocho*', potatoes, sugar cane, honey, sweet fruits, pasta, macaroni and '*shiro*' are good sources of carbohydrates.

■ Which of these foods are simple sugars and should not be eaten in large quantities by patients who have diabetes?

□ Sugar cane, honey, sweet fruits and biscuits are among the food groups that shouldn't be consumed by patients with diabetes.

2.3 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 breastmilk.

2.3.1 Sources of protein

The main sources of proteins are meats, chicken, eggs, breastmilk, 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 (see Figure 2.1) are usually not as good for body-building as animal proteins, they can become more effective nutritionally when both are mixed with each other.

■ Look again at the list of foods you wrote in Section 2.1.2. Which of these foods are sources of protein? Which of these food groups have good quality protein?

□ Beans, nuts, lentils, breastmilk, meat, egg, chicken, cheese and milk are sources of protein. Really good quality protein can be found in animal sources such as breastmilk, meat, eggs, chicken, cheese and milk.

Figure 2.1 Meat is a good source of protein.
(Photo: Dr Basiro Davey)

2.4 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. Fat is found in meat, chicken, milk products, butters, creams, avocado, cooking oils and fats, cheese, fish and ground nuts.

2.4.1 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 breastmilk.

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.

■ Look at the list of foods you wrote in Section 2.1.2. Which of these foods are sources of fats? Which of these fats are not healthy 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.

2.5 Water

You may remember from Study Session 1 that a 50 kg adult contains about 31 litres of water and a one year old, 10 kg child contains nearly 8 litres of water. Almost every part of the body contains large amounts of water.

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 litres of water each day. That is why giving drinks are so important when people lose a lot of water, such as when they have diarrhoea.

Water is essential for life. We need water for a number of reasons:

- For the body to make cells and fluids such as tears, digestive juices and breastmilk
- For the body to make sweat for cooling itself
- For essential body processes — most take place in water
- For keeping the lining of the mouth, intestine, eyelids and lungs wet and healthy
- For the production of urine, which carries waste from the body.

2.6 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.

2.6 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.

2.7 Micronutrients in detail

2.7.1 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.

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 utilised 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.

The best sources of micronutrients in our diets are fruits and vegetables. These two food groups contain essential vitamins and minerals. Animal sources of foods are also both good sources of micronutrients. However, an adequate micronutrient intake can only be achieved through sufficient intake of a balanced diet that includes plenty of fruits and vegetables. Table 2.1 overleaf sets out the functions of some of the important vitamins and examples of sources of food for each of these.

Table 2.1 Functions and sources of vitamins.

Vitamins	Function	Food sources
Vitamin A	Night vision Healing **epithelial** cells Normal development of teeth and bones	Breastmilk, 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 cerals
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) Breastmilk

Epithelial 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.

2.7.2 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. Table 2.2 outlines the functions of some of these important minerals and examples of sources of food for each of these.

Table 2.2 Functions and sources of common minerals.

Minerals	Function	Food sources
Calcium	Gives bones and teeth rigidity and strength	Milk, cheese and dairy products Foods fortified with calcium, e.g. flour, cereals. eggs, fish cabbage
Iron	Formation of haemoglobin	Meat and meat products Eggs, bread, green leafy vegetables, pulses, fruits

Iodine	For normal metabolism of cells	Iodised salt, sea vegetables, yogurt, cow's milk, eggs, and cheese Fish; plants grown in iodine-rich soil
Zinc	For children to grow and develop normally; for wound healing	Maize, fish, breastmilk, meat, beans
Fluorine	Helps to keep teeth strong	Water

- What are the main sources of micronutrients and why are they important as part of a healthy diet?

- 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 Extension Practitioner is to advise people in your community to have a balanced diet that includes micronutrients.

You will learn more about micronutrients in Study Session 7, in particular the impact of deficiencies in vitamin A, iron and iodine on individuals and communities.

2.8 A balanced diet

You have already come across the term 'balanced diet' several times in this Module. In this section we'll discuss what a balanced diet is and the benefits of a balanced diet. It is important that you know enough to be able to recommend a balanced diet for the people in your community.

Eating a balanced diet means choosing a wide variety of foods and drinks from all the food groups. It also means eating certain things in small amounts, namely saturated fat, cholesterol, simple sugar, salt and alcohol. The goal is to take in all of the nutrients you need for health at the recommended levels and perhaps restrict those things that are not good for the body. Figure 2.2 shows you some good sources of micronutrients in a selection of food at a market.

Figure 2.2 Good sources of micronutrients (Photo: Dr Basiro Davey)

To know if the diet is balanced and to plan a balanced diet you have to think about two things: the mixture of foods and the amount of food a person eats.

2.8.1 Helping families to have good balanced diet

The best way to help individuals in your community prepare a balanced diet is to learn which foods people use, the amount of different foods available, and how they prepare their meals. Then you can decide if people need help or further support or information to improve the balance of things they eat.

Fat and added sugars come mostly from fats, oils and sweets, but can be part of or added to food from the other food groups as well.

Figure 2.3 overleaf shows a **food pyramid**. It helps us identify the food groups people should combine in order to make a balanced diet. The food groups at the top of the pyramid should be eaten in moderation (small amount) but food groups at the bottom of the pyramid should be eaten in larger amounts.

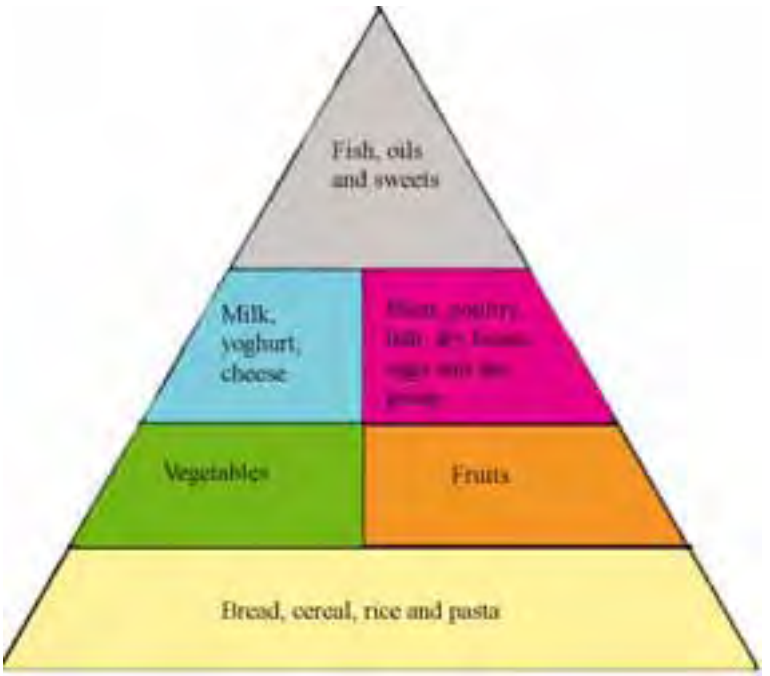


Figure 2.3 Food pyramid

2.8.2 The mixture of foods to use

The staple food is the common type of food that is consumed by the community. It should be part of a balanced diet because it's the main part of most meals. The staple diet may vary from region to region. For example, '*injera*' is the staple diet in many sites, maize in other areas, and '*kocho*' in the southern part of the country. These foods are usually cheap, and provide most of the energy, protein and fibre in a meal, as well as some vitamins.

2.8.3 Adding other foods to the staple food

In order to have a good balanced diet, people in your community will need to eat other foods in addition to the staple foods. The additional foods are important because they:

- Provide nutrients that may not be available in the staple food. For example, legumes such as peas, beans and lentils add protein, iron and other minerals and fat; green and yellow vegetables and fruits add vitamins A and C, folate, and fibre
- Make the food less bulky
- Make the diet more tasty and interesting to eat.

A diet which is composed of staples, legumes and vegetables or fruits is a good, balanced diet because this combination of foods will provide most of the nutrients that the people in your community need. The problem with the diet above is a lack of animal sources of food. Animal sources are good because they contain plenty of protein, have high energy (due to the fats), and the iron is easily absorbed compared with the iron sourced from plants. Therefore adding small amounts of animal products like meat, milk and eggs to staples, legumes and vegetables will improve the balanced diet. As well as protein, animal foods will also provide fat (for energy) and vitamins (especially vitamin A and folate), iron and zinc. But these foods may not be easily available and even if they are, they are usually expensive.

- Think about the types of foods usually consumed by your community and write a list of two groups of balanced diets, one with presence of animal foods and the other without animal foods.

- If you are creating a diet that includes animal products '*kocho*' may be the staple food and this could be eaten with fried meat/fried eggs, cabbage and tomatoes.

  You could create a balanced diet by mixing '*injera*' (as a staple food), stew ('*wot*') made of beans/lentils, oil, '*shiro*' and cabbage.

Summary of Study Session 2

In Study Session 2 you have learned that:

1 Carbohydrates, proteins, fats, vitamins, minerals, water and fibre are the main groups of nutrients which together, but in variable amounts, make up a balanced diet.

2 Nutrients are grouped into macronutrients and micronutrients. Carbohydrates, proteins, fats and water are macronutrients, and vitamins and minerals are micronutrients.

3 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.

4 Unsaturated fats are healthy fats; saturated fats are unhealthy fats. Therefore people in your community need to eat more of the unsaturated fats and try to reduce their intake of saturated fats.

5 Vitamins are substances present in small amounts in foodstuffs and are necessary for the body to function normally. Vitamins are also called protective foods.

6 Minerals have a number of functions in the body including developing body tissues and supporting metabolic processes. The minerals that are of most importance are calcium, iron, iodine, zinc and fluorine.

7 In order to have a healthy life and good nutritional status, a person needs to eat a balanced diet. You need to know the commonly used food groups in order to advise the people in your community on how to have a balanced diet.

Self-Assessment Questions (SAQs) for Study Session 2

Now that you have completed this study session, you can assess how well you have achieved its Learning Outcomes by answering these questions. Write your answers in your Study Diary and discuss them with your Tutor at the next Study Support Meeting. You can check your answers with the Notes on the Self-Assessment Questions at the end of this Module.

SAQ 2.1 (tests Learning Outcomes 2.1, 2.2 and 2.3)

For the following nutrients, can you say why they are important and name one source? Are these foods micronutrients or macronutrients?

- Carbohydrates
- Proteins
- Fats and oils.

SAQ 2.2 (tests Learning Outcomes 2.3, 2.4 and 2.5)

Here are some questions members of your community might ask you. What answers would you give?

(a) A woman asks you which is better for her family; animal fats or fish and vegetable oils?
(b) A child is brought to the health centre with diarrhoea. What is the most important advice to give the mother?
(c) A man complains of constipation. What foods should you tell him to include in his diet?
(d) A young boy has a wound which is not healing. You need to make sure that his diet includes enough of one particular vitamin. Which vitamin is this and what foods will provide it?
(e) A mother says that her child doesn't like dairy products. Does this matter? Give reasons for your answer.

SAQ 2.3 (tests Learning Outcome 2.6)

How important is it to include animal sources of food in a diet?

Session 3 Nutritional Requirements Throughout the Lifecycle

Introduction

In the previous two sessions, you learnt about food, diet and nutrients as well as the food sources of the different nutrients.

In this session you will learn about the nutritional needs at different stages of the lifecycle. 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 Extension Practitioner, this study session will help you to give the appropriate messages to different population groups.

Learning Outcomes for Study Session 3

When you have studied this session, you should be able to:

3.1 Define and use correctly all of the key words printed in **bold**. (SAQs 3.1 and 3.4)

3.2 Describe the food needs of pregnant and breastfeeding mothers. (SAQs 3.1 and 3.2)

3.3 Describe the nutrient requirements during infancy and childhood. (SAQs 3.2 and 3.3)

3.4 Describe the nutritional requirements of adolescents and adults. (SAQ 3.4)

3.5 Describe the nutrient needs of older people. (SAQ 3.3)

3.1 Why it is important to know nutritional requirements

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 programmes.

Diagnostic reasons: mainly to identify whether a group or an individual is suffering from malnutrition of any kind; for example:

- to evaluate nutritional intervention programmes
- 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.

Based on these factors, nutritional requirements in the different segments of the population can be classified into four groups. These correspond to different parts of the lifespan, namely (a) pregnancy and lactation, (b) infancy and childhood (c) adolescence and adulthood, and (d) old age. You are now going to look at each of these in turn.

3.2 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. The increased requirement of nutrients during pregnancy and lactation is shown in Box 3.1.

Box 3.1 Increased nutrients required during pregnancy

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 (Figure 3.1). 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.

Figure 3.1 Gaining weight during pregnancy.

3.2.1 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.

■ A 29 weeks pregnant woman (that is seven months and one week) has already gained 12 kilograms of weight. What would you advise her and why?

□ Even though the pregnant woman has gained 12 kg (the minimum required being 11 kg), you should advise her to continue to gain weight little by little until her baby is born. This is because the unborn baby puts on most of its weight during the last months of pregnancy.

3.2.2 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 iodised 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 malarious 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 or albendazole (you will learn about the doses for this in Study Session 7 of this Module).
- 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).

Remember, there is no need for high-priced foods! A pregnant or lactating woman can get extra foods by eating a little more of ordinary meals. She should increase the amount of nourishment at one or two meals, not every meal.

3.2.3 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 anaemia include:

- Babies will be born without three to six months iron supply
- Breastmilk 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.

3.2.4 Pregnant women with special needs

Some pregnant women in your community will be particularly vulnerable. As a Health Extension Practitioner it is important that you identify the women who may need extra help and support. Box 3.2 gives examples of women who may need special help from you and outlines the kinds of service you can provide for them.

Box 3.2 Identifying and helping pregnant women who need special help

Pregnant women who might need special help include:

- Women from poor families, or who are unemployed
- Women who are widows/separated, and have no support
- Mothers who have given birth to many babies over a short time
- Women who are ill from diseases like Tuberculosis (TB)
- Women who look thin and depressed
- Mothers whose previous babies were small and malnourished
- Teenagers
- Women with a history of their baby or babies dying in their first year of life
- Mothers overburdened with work
- Mothers who are very worried, particularly first time pregnancies.

The Health Extension Practitioner's role:

- Visit the pregnant women often
- Encourage them to eat as good mixture of foods as they can afford (fruits, vegetables, animal source foods)
- Let them be the first ones to receive iron or food supplements, when available
- Help them to get proper healthcare
- Encourage other members of the household to do some of the work and lessen the work burden on the woman.

■ What are the effects of low maternal iron level for the baby and mother in pregnancy?

□ The mother will have difficulty during childbirth and pregnancy. The baby of an anaemic mother will not develop well and will have low birth weight. The baby will then be easily affected by different infections.

■ Which parts of the body should you examine to find out whether a pregnant woman is anaemic or not?

□ You should examine the lower eyelids, inside of the lips and the palms of the hand. If there is anaemia, they will be pale whitish; if there is no anaemia they will be pinkish.

3.3 Nutrition during lactation (breastfeeding)

If all babies are to be healthy and grow well, they must be fed breastmilk. When a baby sucks at the nipple, this causes the milk to come into the breast and continue to flow. Breastmilk 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. You will learn more about this in Study Session 4 of this Module. Box 3.3 shows the nutrients required during lactation.

Box 3.3 Increased nutrients required during lactation

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:

- Iodised salt in her diet
- At least one litre 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).

You have learnt what pregnant and lactating women require to be healthy and well for themselves and their babies. Now you are going to look at the nutritional requirements of infants, children and adolescents.

3.4 Nutritional requirements in infancy, childhood and adolescence

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.

3.4.1 Adolescent growth spurt

Adolescents also undergo a very rapid growth during their puberty (called the **pubertal growth spurt**). During the pubertal growth spurt, they increase rapidly both in weight and height. Therefore, they need a nutrient intake that is proportional with their rate of growth. The growth rate is very high right after birth (infancy). Then the growth rate slows down until the age of 12–14 years. At about 15–16 years (the pubertal period) there is a sharp rise in growth rate/velocity. After that, the growth rate slows down again.

Requirements for macronutrients (proteins, carbohydrates and fats) and micronutrients are higher on a per kilogram basis during infancy and childhood than at any other developmental stage. These needs are influenced by the rapid cell division occurring during growth, which requires protein, energy and fat. Increased needs for these nutrients are reflected in daily requirements for these age groups, some of which are briefly discussed below.

3.4.2 Increased need for nutrients

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, breastmilk 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 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%

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

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, diarrhoea or exposure to very cold or very hot temperatures.

Infants and children need plenty of water to drink, particularly when ill, or exposed to extreme temperatures.

Essential fatty acids

Requirements for fatty acids or fats on a per kilogram basis are higher in infants than adults (see Box 3.4). 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.

Box 3.4 Increased nutrients required during infancy, childhood and adolescence

Infancy and childhood

Increased requirements of energy, protein, essential fatty acids, calcium and phosphorus.

Adolescence

Increased requirements of energy, protein, calcium, phosphorus and zinc.

3.5 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.

3.6 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). Box 3.5 overleaf sets out some of the problems an older person might experience which could impact on their diet.

Box 3.5 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.

3.6.1 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 tumours (malignancies). Vitamin B6 helps to boost selenium levels, so a higher intake for people aged 51–70 is recommended.

Nutritional interventions should first emphasise healthy foods, with supplements playing a secondary role. Although modest 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.

3.7 Nutritional requirements throughout the life cycle: conclusion

Requirements for energy and micronutrients change throughout the life cycle. Although inadequate intake of certain micronutrients is a concern, problems also come from the dietary excesses of energy, saturated fat, cholesterol and eating refined carbohydrates, all of which are contributing to obesity and chronic disease in developed countries. Below is a summary of the number of meals required at different stages in the lifecycle that might assist you in your work in your community.

Elderly people

Need at least two and if possible more meals each day as they may not eat much at each meal. They need fewer calories than younger people, but about the same amount of protein and other nutrients. Women who have stopped menstruating need less iron than childbearing women. Old people may need soft food.

Men

Need at least two mixed meals every day and some snacks. They can get enough energy from few large meals and from bulky food.

Women

Need at least two mixed meals every day and some snacks. If they are pregnant or lactating they need as almost as much food as men, especially if they are also doing hard physical work. They need much more iron and folate than men especially when they are pregnant.

Adolescents

Need at least two large mixed meals and some snacks each day. They can eat bulky food. Boys need a lot of calories. Girls need plenty of iron. Pregnant adolescent girls are still growing so they need more food than pregnant women.

School aged children

Need at least two to three mixed meals and some snacks each day.

Children 1–5 years old

Need breastmilk until they are at least two years old. They need at least three mixed meals and two snacks each day. They cannot eat large bulky meals. It is especially important for the meals to be clean and not to contain parasites or microorganisms that could cause diarrhoea or other infection.

Babies 6-12 months

Need breastmilk eight to ten times or more each day. They need small meals, which are not bulky, three to five times a day.

Babies under 6 months old

Need only breastmilk at least eight to ten times each day.

As a Health Extension Practitioner, you can assist families in choosing foods that keeps energy intake within reasonable bounds, while maximising intake of nutrient-rich foods, particularly vegetables, fruits, legumes and whole grains.

Self-Assessment Questions (SAQs) for Study Session 3

Now that you have completed this study session, you can assess how well you have achieved its Learning Outcomes by answering the questions below. Write your answers in your Study Diary and discuss them with your Tutor at the next Study Support Meeting. You can check your answers with the Notes on the Self-Assessment Questions at the end of this Module.

SAQ 3.1 (tests Learning Outcomes 3.1 and 3.2)

A pregnant woman asks your advice about what to eat because she is worried about having another low birth weight baby. What should you tell her?

SAQ 3.2 (tests Learning Outcomes 3.2 and 3.3)

Mrs X tells you she does not have enough milk for her baby. What questions would you want to ask before deciding how best to help her?

SAQ 3.3 (tests Learning Outcomes 3.3 and 3.5)

Children and elderly people both need special nutritional care. However, the care they need is different. What are two of these differences?

SAQ 3.4 (tests Learning Outcomes 3.1 and 3.4)

A mother is worried because her adolescent son is eating so much. Is she right to be so worried? What are the reasons for your answer?

Study Session 4 Infant and Young Child Feeding

Introduction

In Study Session 3 you were introduced to nutrition throughout the life cycle. In this study session you will learn about optimal infant and young child feeding during the first two years of life. As the first two years are critical to break the cycle of malnutrition from generation to generation, key feeding issues, including optimal breastfeeding and optimal complementary feeding, will be looked at in some detail. You will learn more about the key messages you can give the mother regarding optimal feeding practices during the different contacts that you have with her.

Learning Outcomes for Study Session 4

When you have studied this session, you should be able to:

4.1 Define and use correctly all of the key words printed in **bold**. (SAQ 4.1)

4.2 Describe infant and young child feeding problems in Ethiopia. (SAQ 4.1)

4.3 List the key messages to be given to mothers on optimal breastfeeding. (SAQs 4.2 and 4.3)

4.4 Outline the feeding recommendations for mothers who are HIV-positive. (SAQ 4.4)

4.5 List the benefits of breastfeeding for mothers, children and the community. (SAQ 4.2)

4.6 Describe breastfeeding problems and identify their solutions. (SAQ 4.5)

4.7 List the key messages to be given to mothers on optimal complementary feeding. (SAQ 4.6)

4.1 Infant and young child feeding problems in Ethiopia

Optimal feeding of children during the first two years is critical to break the cycle of malnutrition from generation to generation. The first 24 months is recognised as being the most important window of opportunity for establishing healthy growth. Infant and child feeding practices are major determinants of the risk of malnutrition. A very large proportion of women do not practice optimal breastfeeding and complementary feeding behaviour for their children. About a third of babies do not receive breastfeeding within one hour of birth and only one in three children age four to five months are exclusively breastfed. According to profiles analyses using Demographic Health Survey data, it is estimated in Ethiopia that there are about 50,000 infant deaths a year attributable to poor breastfeeding habits, that is, 18% of all infant deaths every year. You have a critical role to play in helping to address this problem (see Figure 4.1).

The first two years of a child's life are the most important for establishing healthy growth.

Figure 4.1 A Health Extension Practitioner counselling a mother on feeding her child. (Photo: UNICEF Ethiopia / Indrias Getachew)

Equally important are the serious problems related to when complementary food is introduced, because a large majority of infants are given such foods too early or too late. At six to eight months of age, only one in two children

is consuming solid or semisolid food. Much of the inappropriate breastfeeding and complementary feeding behaviour is actually due to lack of knowledge, rather than practical or financial constraints, and you will have plenty of opportunities in your work to give mothers the best information possible.

4.2 Global and national recommendations for child feeding during the first 24 months

Nearly one in five infant deaths each year are attributable to poor breastfeeding habits.

Based on the global infant and young child feeding recommendations developed by the World Health Organisation in 2002, the Ethiopian National Infant and Young Child Feeding (IYCF) Guideline was developed in 2004. The guideline stresses the following IYCF strategies during the first two years:

- **Exclusive breastfeeding** during the first six months (exclusive breastfeeding is defined as giving only breastmilk and no other food or fluid including water except medication)
- Start optimal **complementary feeding** at six months with continuation of breastfeeding for the first two years or beyond (complementary feeding means giving solid or semisolid food to a child in addition to breastmilk).

4.2.1 Key messages for optimal breastfeeding practices

An important part of your job is connected to helping mothers and caregivers to feed their children in the most effective way possible. It is therefore very important that you help them to understand the importance of optimal breastfeeding. The following are key messages that need to be explained to the mother. You should make sure that she understands why these behaviours are important and that you have given her the underlying reasons for each of the key messages. You will be using these messages when you are educating or counselling mothers.

The mother initiates breastfeeding within one hour of birth

Figure 4.2 Feeding on demand is best for babies.

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 mother breastfeeds frequently, day and night

The mother needs to breastfeed frequently to stimulate milk production.

The mother should allow the infant to breastfeed on demand (as often as the infant wants) (see Figure 4.2). This means feeding every two to three hours (8–12 times per 24 hours) or more frequently if needed, especially in the early months. The mother needs to breastfeed frequently to stimulate milk production. Breastmilk is perfectly adapted to the infant's small stomach size because it is quickly and easily digested.

The mother gives infant only breastmilk for the first six months.

Breastmilk contains all the water and nutrients that an infant needs to satisfy its hunger and thirst. Exclusive breastfeeding helps to space births by delaying the return of fertility. Exclusively breasted infants are likely to have fewer diarrhoea, respiratory, and ear infections. You should encourage and support the mother to exclusively breastfeed her baby, explaining how it will help both her and her infant (see Figure 4.3).

The mother continues breastfeeding when either she or the infant is sick

Sick infants need breastfeeding more frequently.

If the mother is sick with a cold, flu or diarrhoea, she can continue to breastfeed because breastmilk still protects the infant against illness. If the infant is sick, mother has to breastfeed *more frequently* (or express her milk if the infant cannot breastfeed) so that the infant recuperates faster. Breastmilk replaces water and nutrients lost through frequent loose stools, and is the most easily digestible food for the sick infant.

The mother positions and attaches infant correctly at the breast

The mother has to position and attach the infant to the breast correctly to help prevent sore or cracked nipples, and to stimulate her milk supply. Signs that infant is properly positioned are:

- The infant's whole body is facing the mother and is close to her
- The mother holds infant's entire body, not just the neck and shoulders.

Signs that infant is properly attached include:

- The mother brings infant toward her breast, not the breast toward her infant
- The infant's mouth is open wide
- The infant's lips are turned outwards (like a fish mouth)
- The infant's chin touches the mother's breast
- The mother's entire nipple and a good portion of the areola (dark skin around the nipple) are in the infant's mouth
- More areola is showing above rather than below the nipple.

Figure 4.3 Health Extension Practitioner counselling a mother on exclusive breastfeeding. (Photo: UNICEF Ethiopia / Indrias Getachew)

The *IMNCI* Module provides more details about effective breastfeeding and how you can support mothers to achieve this.

The mother offers the second breast after the infant releases the first

The mother has to allow the infant to release the first breast before offering the second breast so that infant receives both '**fore milk**' which has a high water content to quench the infant's thirst, and '**hind milk**' which is rich in fat and nutrients. The mother should not give bottles and **pacifiers** (dummies) to her breastfed infant because they can interfere with breastfeeding and cause diarrhoea and other possibly serious infections as they are difficult to keep clean.

The mother should eat more than usual

As breastfeeding increases the nutritional requirements of the mother, she needs to have two additional meals (about 500 kcal) every day. Her diet should also be varied (for example by adding vegetables and fruits).

By the age of six months the mother or caregiver must add complementary food

The complementary food given to the child should be varied as much as possible, increasing the quantity, frequency and density of the food as the child gets older. This is in addition to the need for the mother to continue breastfeeding until the child is two years of age or older.

- Why should the mother switch the baby to the second breast only after completely suckling the first one?
- It is important because the fore milk has a high water content to quench the infant's thirst and the baby also needs to get the hind milk which is rich in fat and nutrients.

4.3 Benefits of breastfeeding for the baby

Breastmilk has many advantages over cow's milk or other formula foods. Explaining the following benefits to the mothers will help you to convince them about the practice of breastfeeding.

Figure 4.4 Breastmilk contains all the water and nutrients needed for the infant. (Photo: UNICEF Ethiopia / Indrias Getachew)

4.3.1 Nutritional

Breastmilk has all the necessary nutrients needed for the newborn or infant (see Figure 4.4). This is true even if the mother is not taking adequate amounts of the nutrients for her own needs. Moreover it is free of contamination and does not need any preparation. It is also **self-regulatory**; breastmilk secretion occurs based on the need of the infant, so if there is more feeding there will be more secretion. If the mother tries to introduce supplementary food such as formula milk early in the life of the baby (as early as under four months), there will be replacement of the clean, nutritious breastmilk by formula or cow's milk which is more likely to be contaminated, resulting in increased risk of infection. Therefore, breastmilk should be considered to be a whole food for the infant because it contains balanced proportions and a sufficient quantity of all the nutrients needed for the first six months. Box 4.1 summarises the key benefits of breastfeeding for the baby.

Box 4.1 Nutritional benefits of breastfeeding.

- Breastmilk is always clean
- Breastmilk is always ready and at the right temperature
- Breastmilk is easy to digest
- Nutrients are easily absorbed from breastmilk
- Breastmilk protects against allergies
- Breastmilk antibodies protect the baby's gut by preventing harmful substances from passing into the blood
- Breastmilk contains enough water for the baby's needs
- Breastmilk has a low protein content which makes it suitable for feeding small infants before their kidneys are fully developed. The amount of protein is adequate to promote the normal growth of the baby
- Breastmilk is low in saturated fatty acids; saturated fatty acids from cow's milk may form a hard curd when they react with hydrochloric acid in the baby's stomach and may result in the impacting of the curd in the intestine. Cow's milk is rich in these acids and also contains large amounts of protein. Breastmilk is much safer.

4.3.2 Builds up immunity

Breastmilk has many active immune agents that protect the child from developing diseases and therefore promotes the normal growth of the child.

4.3.3 Growth factors

Breastmilk is important for the normal growth of the baby.

4.3.4 Development factors

The fat in breastmilk has been found to be very important for the development of the brain. Breastfed children show better intelligence as compared to bottle or formula-fed children.

- Breastfeeding helps jaw and tooth development; suckling develops facial muscles
- Frequent skin-to-skin contact during breastfeeding leads to better psychomotor, affective and social development of the infant and promotes bonding between mother and child.

4.3.5 The infant benefits from colostrum

Colostrum is the first breastmilk that is produced after delivery and protects the baby from diseases. The colostrum acts as a laxative cleaning the infant's stomach. It is also the equivalent of the first immunisation for the baby as it has many immunologic factors and a high concentration of vitamin A.

4.4 Benefits of breastfeeding for the mother

As well as breastfeeding bringing benefits to the baby, you can explain to the mother that there are important benefits to her. Box 4.2 sets out some of these.

Box 4.2 Benefits of breastfeeding for mothers

- Breastfeeding is more than 98% effective as a contraceptive method during the first 6 months provided breastfeeding is exclusive and **amenorrhoea** persists (menstruation has not started)
- Putting the baby to the breast immediately after birth facilitates expulsion of the placenta as the baby's suckling stimulates uterine contractions
- Breastfeeding reduces risks of bleeding after delivery
- Breastfeeding immediately after birth stimulates breastmilk production
- Immediate and frequent suckling prevents engorgement of the breasts
- Breastfeeding reduces the mother's workload (no time is involved in boiling water, gathering fuel or preparing formula milk)
- Breastmilk is available at any time and anywhere, is always clean, nutritious and at the right temperature
- Breastfeeding is economical
- Breastfeeding stimulates bonding between mother and baby
- Breastfeeding reduces risks of pre-menopausal breast and ovarian cancer.

4.5 Benefits of breastfeeding for the family

As well as the benefits that breastfeeding has for the baby in promoting health and optimal growth, it also has some essential economical and social benefits to the family. These are set out in Box 4.3.

Box 4.3 Benefits of breastfeeding for families with infants and young children

- There are no expenses in buying formula, firewood or other fuel to boil water, milk, or utensils. The money saved can be used to meet the family's other needs
- There should be no medical expenses due to the sickness that formula milk might cause. The mothers and their children are healthier
- As illness episodes are reduced in number, the family encounters fewer emotional difficulties associated with the baby's illness
- Births are spaced thanks to the contraceptive effect of breastfeeding
- Time is saved as breastmilk does not need preparation
- Breastfeeding the baby reduces the mother's work load because the milk is always available and ready.

4.6 Benefits of breastfeeding for the community

The benefits of breastfeeding go beyond just having a positive impact for the mother and family. It also has important benefits for the community and therefore the nation. Box 4.4 sets out examples of some of these benefits.

Box 4.4 Benefits of breastfeeding for the community

- Breastmilk does not require importing formula and utensils, which saves hard currency (money)
- Healthy babies make a healthy nation
- Breastfeeding leads to a decrease in the number of childhood illnesses, which leads to decreased national expenditure on treatment. This means that savings are made in the health sector
- Breastfeeding improves child survival (reduces child morbidity and mortality)
- An indirect benefit of breastfeeding if it is practised widely is that the environment is protected. This is because trees are not used for firewood to boil water, milk and utensils. Breastmilk is a natural renewable resource.

■ What are the benefits of colostrum to the baby?

□ Colostrum is the first breastmilk produced after delivery. It protects the baby from diseases and it also acts as a cleaning substance (laxative) for the baby's stomach. It is the equivalent of first immunization of the baby, because of its immunologic factors and high concentration of vitamin A.

■ What is the benefit of breastfeeding to the mother in terms of child spacing?

□ Breastfeeding is more than 98% effective as a contraceptive method during the first six months provided that breastfeeding is exclusive and amenorrhoea persists.

4.7 Breastfeeding difficulties

In your work helping mothers to breastfeed optimally, you may come across mothers who have one or more breastfeeding difficulties. It is very important that you know the common difficulties, how these can be prevented, and ways that you can help mothers to manage and overcome any problems. Table 4.1 summarises the common breastfeeding difficulties that mothers encounter, some prevention methods and possible solutions if problems develop.

Table 4.1 Breastfeeding difficulties and their solutions. (Source: adapted from Academic Education for Development (USAID) Linkages project)

Difficulty or condition	Prevention	Solution
Engorgement	Correct positioning and attachment Breastfeed immediately after birth Breastfeed on demand (as often and as long as baby wants) day and night: 8–12 times per 24 hours Allow baby to finish the first breast before switching to the second breast	Apply a cold compress (a cloth dipped in cold water) to breasts to reduce swelling; apply warm compresses to get milk flowing Breastfeed more frequently or for longer Improve infant positioning and attachment Massage breasts Express some milk Apply a warm bottle
Sore or cracked nipples	Correct positioning of baby Do not use bottles, dummies or pacifiers Do not use soap on nipples	Make sure the baby is positioned well at the breast Make sure the baby latches on to the breast correctly Apply drops of breastmilk to nipples and allow to air dry Remove the baby from the breast by breaking suction first Begin to breastfeed on the side that hurts less Do not stop breastfeeding Do not wait until the breast is full to breastfeed; if full, express some milk first

Plugged breast ducts and mastitis (red, painful and swollen breast)	Get support from the family to perform non-infant care activities Ensure correct attachment Breastfeed on demand Avoid holding the breast in scissors hold (with two fingers in the form of scissors) Avoid sleeping on stomach (mother) Avoid tight clothing Use a variety of positions to rotate pressure points on breasts	Apply heat before the start of breastfeeding Massage the breasts before breastfeeding Increase maternal fluid intake Rest (mother) Breastfeed more frequently Seek medical treatment; if mastitis, antibiotics may be necessary If mother is HIV-positive: express milk and heat, treat or discard Position baby properly
Insufficient breastmilk (mother 'thinking' she does not have enough milk)	Breastfeed more frequently Exclusively breastfeed day and night Breastfeed on demand at least every three hours Correct positioning of baby Encourage support from the family to perform non-infant care chores Avoid bottles and pacifiers	Withdraw any supplement, water, formulas, tea or liquids Feed the baby on demand, day and night Increase frequency of feeds Wake the baby up if it sleeps throughout the night or longer than three hours during the day Make sure the baby latches on to the breast correctly Reassure the mother that she is able to produce sufficient milk Baby takes fore and hind milk
Insufficient breastmilk Insufficient weight gain Fewer than six wet diapers per day Dissatisfied (frustrated and crying) baby	Same as above	Same as above Refer the mother and baby to nearest health centre

Pause reading for a while and think of the difficulties of breastfeeding commonly encountered in your community and think about how you would try to prevent and solve these problems if they occur.

■ What will you advise a mother who thinks she does not have enough milk?

□ You should reassure the mother that breastmilk can be sufficiently produced as long as the baby sucks very well. To ensure sufficient milk production you can advise the mother to do the following:

- Withdraw any supplement, water, formulas, tea or liquids she has been giving the baby
- Feed the baby on demand, day and night
- Increase the frequency of feeds
- Wake the baby up if the baby sleeps a long time between feeds.

It is possible that you may encounter times where breastfeeding may be difficult because of situations that affect either the capacity of the baby to suck, the availability of the mother or the capacity of the mother to breastfeed. Table 4.2 summarises the solutions to a range of different situations where a mother is having problems breastfeeding.

Table 4.2 Special situations during breastfeeding and their solutions. (Source: adapted from Academic Education for Development (USAID) Linkages project)

Special Situation	**Solutions**
Sick baby	Baby under six months: if the baby has diarrhoea or fever the mother should breastfeed exclusively and frequently to avoid dehydration or malnutrition Breastmilk contains water, sugar and salts in adequate quantities, which will help the baby recover quickly from diarrhoea If the baby has severe diarrhoea and shows any signs of dehydration, the mother should continue to breastfeed and provide ORS either with a spoon or cup Baby older than six months: if the baby has diarrhoea or fever, the mother should breastfeed frequently to avoid dehydration or malnutrition. She should also offer the baby bland food (even if the baby is not hungry) and increase the frequency of feeding If the baby has severe diarrhoea and shows any signs of dehydration, the mother should continue to breastfeed and add ORS
Sick mother	When the mother is suffering from headaches, backaches, colds, diarrhoea or any other common illness, she should continue to breastfeed her baby The mother needs to rest and drink a large amount of fluids to help her recover If the mother does not get better, she should consult a doctor and say that she is breastfeeding
Premature baby (baby born before nine months)	The mother needs support for correct breastfeeding Breastfeeding is advantageous for pre-term infants; supportive holds may be required Direct breastfeeding may not be possible for several weeks, but expressed breastmilk may be stored for use by the infant If the baby sleeps for long periods of time, he/she should be unwrapped to encourage waking and held vertically to awaken The mother should watch the baby's sleep and wake cycle and feed during quiet-alert states Crying is the last sign of hunger. Cues of hunger include rooting, licking movements, flexing arms, clenching fists, tensing body and kicking legs
Malnourished mothers	Mothers need to eat extra food ('feed the mothers, nurse the baby') Mothers need to take micronutrients

Mother who is separated daily from her infant	The mother should express or pump milk and store it for use while separated from the baby; the baby should be fed this milk at times when he/she would normally feed The mother should frequently feed her baby when she is at home The mother who is able to keep her infant with her at the work site should feed her infant frequently
Twins	The mother can exclusively breastfeed both babies The more each baby nurses, the more milk is produced
Inverted nipples	Detect during pregnancy Try to pull nipple out and rotate (like turning the knob on a radio) Make a hole in the nipple area of a bra. When a pregnant woman wears this bra, the nipple protrudes through the opening If acceptable, ask someone to suckle the nipple
Baby who refuses the breast	Position the baby properly Treat engorgement (if present) Avoid giving the baby teats, bottles, pacifiers Wait for the baby to be wide awake and hungry (but not crying) before offering the breast Gently tease the baby's bottom lip with the nipple until he/she opens his/her mouth wide Do not limit duration of feeds Do not insist on more than a few minutes if baby refuses to suckle Avoid pressure to potential sensitive spots (pain due to forceps, vacuum extractor, clavicle fracture) Express breastmilk, and give to the baby by cup

Mother who will be away from her infant for an extended period expresses her breastmilk; caregiver feeds expressed breastmilk from a cup.	The mother expresses breastmilk by following these steps: • Washes hands • Prepares a clean container • Gently massages breasts in a circular motion • Positions her thumb on the upper edge of the areola and the first two fingers on the underside of the breast behind the areola • Pushes straight into the chest wall • For large breasts, first lifts and then pushes into the chest wall • Presses the areola behind the nipple between the finger and thumb • Presses from the sides to express milk from the other segments of the breast • Repeats rhythmically: position, push, press; position, push, press • Rotates the thumb and finger positions The mother stores breastmilk in a clean, covered container. Milk can be stored 8–10 hours at room temperature in a cool place and 72 hours in the refrigerator The mother or caregiver gives the infant expressed breastmilk from a cup. Bottles are unsafe to use because they are difficult to wash and can be easily contaminated
HIV-positive mother who chooses to breastfeed	The mother should practice exclusive breastfeeding for six months. At six months the mother should introduce appropriate complementary foods A mother who experiences breast difficulties such as mastitis, cracked nipples or breast abscess should breastfeed with the unaffected breast and express and discard milk from the affected breast The mother should seek immediate care for a baby with thrush or oral lesions A mother who presents with AIDS-related conditions (prolonged fever, severe cough or diarrhoea, or pneumonia) should visit a health centre immediately A lactating mother should use condoms to protect herself from exposure to infected semen
HIV-positive mother who chooses to replacement feed	The mother should practice safe and appropriate use of infant formula or animal's milk (with additional sugar) exclusively for the first six months The mother should use a cup, not a bottle The mother should NOT mix-feed – *give only breastmilk substitutes, do not breastfeed*

■ What solutions would you advise the mother of a sick baby under six months with diarrhoea?

□ You would advise the mother to breastfeed exclusively and frequently to avoid dehydration or malnutrition. You would explain to her that breastmilk contains water, sugar and salts in adequate quantities, which will help her baby recover quickly from diarrhoea. If the baby has severe diarrhoea and shows any signs of dehydration, tell the mother she should continue to breastfeed and provide Oral Rehyderation Solution (ORS) either with a spoon or cup.

4.8 Key messages for optimal complementary feeding practices

Both the quantity and quality of complementary foods are important to ensure good health and development for the baby and young child. Infants older than six months should eat a variety of nutrient-rich foods, including animal products (e.g. eggs, beef, chicken, lamb, milk, cheese and butter), fruits, and vegetables. It is usually not possible for an infant to consume sufficient quantities of plant foods to meet their needs for iron, zinc and calcium. Therefore, the addition of animal source foods enables the different nutrients to be absorbed more easily and is essential in the preparation of complementary foods.

When you are advising mothers and caregivers about optimal complementary feeding, there are a number of key messages you can give. These are set out below.

At six months, the mother or caregiver must introduce soft, appropriate foods and continue breastfeeding on demand.

- When the infant is six months old the mother must give the infant complementary foods in addition to breastmilk to help the infant grow strong and healthy. At this age, breastmilk alone cannot meet all the nutritional needs for growth and development
- The mother should continue to give breastmilk as the main food throughout the infant's first year. Breastmilk will continue to protect the child against illness
- The mother or caregiver should begin complementary feeding by adding available, feasible, local foods (vegetables, fruits, eggs, milk) to **staple foods** (cereals and legumes) and increase the amount of food as the child grows
- The mother should continue breastfeeding until child is at least two years old.

Breastmilk constitutes the largest portion of young child's food during the first two years. Figure 4.5 shows what percentage of breastmilk should be in a child's diet from birth to two years.

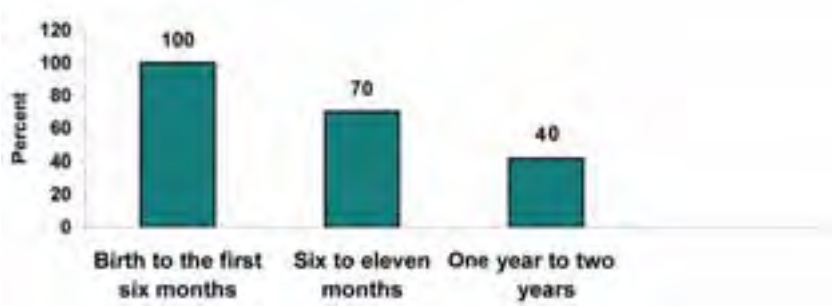


Figure 4.5 Contribution of the breastmilk to the child's energy needs during the first two years.

Here are some additional important messages about feeding.

Increase frequency of feedings

- The mother or caregiver should increase the frequency of feedings and the amount of food as the child gets older
- The mother or caregiver should use a separate bowl for the child and continue frequent breastfeeding
- The mother or caregiver should give young children small feeds frequently throughout the day (both day and night) because they have very small stomachs
- As the child grows, the mother or caregiver should give the child more food. One way to know children are getting enough food is to put their portions in separate bowls and to help them eat. This is known as **responsive feeding**. Table 4.3 summarises the frequency of meals, and their number according to the age of the child.

As the child gets older, the mother needs to provide more food and increase the frequency of meals.

Table 4.3 Frequency of meals, and their number according to the age of the child.

Age (months)	Meal frequency per day for breastfed baby	Meal frequency per day for non-breastfed baby
6–9	2–3 times + 1–2 snacks	4-5 times + 1–2 snacks
10–23	3–4 times + 1–2 snacks	

Increase food thickness and variety

At six months, the mother or caregiver can give the infant puréed (softened), mashed and semi-solid foods. She should also add protein-rich foods (animal/plant); beans, soya, chick peas, groundnuts, eggs, liver, meat, chicken and milk. Adding germinated (malt) flour to the gruel liquefies cereal gruels and helps to increase the energy value and other nutrient density. At eight months the mother or caregiver can give foods that infant can eat alone, such as cut-up fruit and vegetables (for example, mangoes, papaya, leafy greens, oranges, bananas, pumpkin, carrots and tomatoes). During complementary feeding, the aim is for the mother or caregiver to gradually accustom the child to family foods. By 12 months the child should be eating family foods.

Increase food thickness (density) and variety as the child gets older, to meet changing nutritional requirements, and the child's physical abilities.

Interact with the child during feeding

The mother or caregiver should interact with the child during feeding. This is known as active or responsive feeding. This helps the child take in the food they need and stimulates the child's verbal and intellectual development. The

mother or caregiver should also feed the infant directly and help older children eat and experiment with food combinations, tastes and textures. Most mothers will be able to find ways to encourage children who refuse certain foods. In order to help the baby finish its food, the mother or caregiver should minimise distractions during meals, especially if the child loses interest easily. The mother or caregiver has to remember that feeding times are periods of learning and love; talking to a child during feeding, with eye-to-eye contact and patience, encouraging but not forcing the infant to eat, is important. The mother can also sing songs or tell stories to make feeding enjoyable.

Practice good hygiene and safe food preparation

In resource-poor settings, the mother or caregiver can feed liquids to the child from a small cup or bowl, as bottles are difficult to keep clean, and contaminated bottles can cause diarrhoea. Before feeding the child, the mother or caregiver should wash their hands and the child's hands with soap and water and use clean utensils and bowls or dishes to avoid introducing dirt and germs that might cause diarrhoea and other infections. The mother or caregiver can use their fingers (after washing) to feed the child. Food can be contaminated as a result of poor basic hygiene, poor sanitation, and poor methods of food preparation and storage, so food should be served immediately after preparation.

Increase the amount of food provided each day

As children grow older, they need to eat more food each day. Table 4.4 shows the increase in calories needed every day by a child according to their age.

Table 4.4 Amount of calories needed by the age of the child.

Age (months)	**Amount of kilocalories for the breastfed baby**	**Amount of kilocalories for the non-breastfed baby**
6–8	200 Kcal	600 Kcal
9–11	300 Kcal	700 Kcal
12–23	550 Kcal	900 Kcal

Increases complementary food if the child becomes sick

The mother should continue to breastfeed when the child is ill and should encourage the child who is older than six months to eat during and after illness (**sick child feeding**). The mother should offer the child who is older than six months soft, mashed favourite foods. Breastfeeding is extremely important during illness. Children who are ill will often continue to breastfeed even if they refuse other foods.

The mother diversifies the complementary food

The mother should mix foods from plant sources such as fruits, vegetables, cereals and legumes with foods of animal origin in order to diversify the complementary food. During illness and for two weeks after illness, the mother or caregiver should increase the quantity of food and feed the child more often so that the child recovers quickly. Children are often very hungry during recovery from illness and need more food to support catch-up growth and to replace nutrient stores.

- Kedija's daughter is six months old and she wants to start giving her complementary food. What do you advise Kedija about feeding her child at this age?

- You would talk to Kedija about the different types of food she can give her daughter to promote optimum growth and the baby's health. At six months Kedija can give her daughter puréed, mashed and semi-solid foods. She should also add protein-rich foods (animal/plant): beans, soya, chick peas, groundnuts, eggs, liver, meat, chicken, milk. Adding germinated (malt) flour to the gruel liquefies cereal gruels, and helps to increase the energy and other nutrient density. You should also advise her to continue breastfeeding until her daughter is at least two years old.

The first 24 months of life provide a critical opportunity to ensure a child has a healthy start through optimal feeding. You have learned that malnutrition can be prevented through exclusive breastfeeding for the first six months of a baby's life, followed by the introduction of complementary food.

Complementary food should be started at exactly six months, not before or after six months, as either would lead to poor nutritional status of the young child. The consequences of poor nutritional status include morbidity, poor growth and development and mortality.

Summary of Study Session 4

In Study Session 4 you have learned that:

1 Children should be fed optimally during the first 24 months of their lives as this is a critical window of opportunity to break the cycle of malnutrition which otherwise can be passed from generation to generation.

2 Breastmilk is the best and most nutritious food for the baby during the first two years. It has several advantages for the baby compared to cow's milk or other replacement food.

3 Feeding for the first 24 months should be based on exclusive breastfeeding during the first six months, with complementary foods introduced at six months in addition to ongoing breastfeeding.

4 Complementary food should be increased in frequency, amount and density (thickness and nutrient content) as the child grows.

5 Mothers should increase the frequency of breastfeeding and complementary feeding (if the child has already started it) during illness.

6 Mother should give a diversified diet to their baby and include animal sources of foods to increase the density of nutrients in the complementary food.

7 HIV-positive mothers should either exclusively breastfeed or exclusively replacement feed. Mixed feeding is dangerous as it exposes the baby to mother-to-child transmission of HIV.

Self-Assessment Questions (SAQs) for Study Session 4

Now that you have completed the study session, you can assess how well you have achieved its Learning Outcomes by answering these questions. Write your answers on your Study Diary and discuss them with your Tutor at the next Study Support Meeting. You can check your answers with the notes on the Self-Assessment Questions at the end of the Module.

SAQ 4.1 (tests Learning Outcomes 4.1 and 4.2)

Why is it so important for you to be able to advise mothers about how to feed babies and very young children?

SAQ 4.2 (tests Learning Outcomes 4.3 and 4.5)

Whilst giving education to mothers about breastfeeding, they may ask you why they need to breastfeed their babies when they can give them cow's milk or formula and go to work. What would you tell them to try to convince them?

SAQ 4.3 (tests Learning Outcome 4.3)

A mother who is expecting her first baby soon is very keen to breastfeed and asks for your advice. What is the key advice you should give her now so she is prepared for the first few weeks?

SAQ 4.4 (Tests Learning Outcome 4.4)

What advice should you give to an HIV-positive mother who is unable to buy replacement foods?

SAQ 4.5 (tests Learning Outcome 4.6)

A mother tells you that breastfeeding is hurting her. What kinds of pain might she be referring to? Would you advise her to stop breastfeeding until the pain goes? Give reasons for your answer.

SAQ 4.6 (Tests Learning Outcome 4.7)

Suppose you want to educate a mother about optimal complementary feeding. What are the key messages you will give her?

Study Session 5 Nutritional Assessment

Introduction

In Study Session 4 you learned about infant and young child feeding that will promote optimal growth and the most favourable development of infants and young children. In this study session you will learn about different methods of assessing the nutritional status of children and adults. Biochemical, biophysical and dietary methods of assessing nutritional status are briefly introduced. You will also learn more about the anthropometric and clinical methods of assessing nutritional status as they are more applicable to your practice.

Learning Outcomes for Study Session 5

When you have studied this session, you should be able to:

5.1 Define and use correctly all of the key terms printed in **bold**. (SAQs 5.1 and 5.2)

5.2 Describe anthropometric measurements used for community level screening of malnutrition. (SAQs 5.2 and 5.3)

5.3 Identify anthropometric indicators of the nutritional status for children, adults and pregnant women. (SAQs 5.3, 5.4 and 5.5)

5.4 Identify children and adults with malnutrition by comparing their measurements to cut-off values. (SAQ 5.4)

5.5 Assess micronutrient deficiencies using clinical signs and symptoms. (SAQ 5.6)

5.1 Nutritional assessment

As a Health Extension Practitioner you will frequently be dealing with your community's nutritional problems. Using different nutritional assessment (see Box 5.1) methods discussed in this section you will learn how to assess the nutritional status of children, mothers and other adults living in your community.

Box 5.1 Definition of nutritional assessment

Nutritional assessment is the interpretation of anthropometric, biochemical (laboratory), clinical and dietary data to determine whether a person or groups of people are well nourished or malnourished (over-nourished or under-nourished).

Nutritional assessment can be done using the ABCD methods. These refer to the following:

(A) Anthropometry

(B) Biochemical/biophysical methods

(C) Clinical methods

(D) Dietary methods.

The word **anthropometry** comes from two words: *Anthropo* means 'human' and *metry* means 'measurement'. In your community you will be able to use anthropometric measurements to assess either growth or change in the body composition of the people you are responsible for. The different measurements taken to assess growth and body composition are presented below.

5.2 Anthropometric measurements used to assess growth

To assess growth in children you can use several different measurements including length, height, weight and head circumference.

5.2.1 Length

A wooden measuring board (also called sliding board) is used for measuring the length of children under two years old to the nearest millimetre (as shown in Figure 5.1). Measuring the child lying down always gives readings greater than the child's actual height by 1–2 cm.

To measure the length of a child under two years, you need one assistant and a sliding board.

Procedure

As you can see in Figure 5.1, you need an assistant to help you measure a child using this method.

1 Both assistant and measurer are on their knees (arrows 2 and 3).
2 The assistant holds the child's head with both hands and makes sure that the head touches the base of the board (arrow 4).
3 The assistant's arms should be comfortably straight (arrow 5).
4 The line of sight of the child should be perpendicular to the base of the board (looking straight upwards) (arrow 6).
5 The child should lie flat on the board (arrow 7).
6 The measurer should place their hands on the child's knees or shins (arrow 8).
7 The child's foot should be flat against the footpiece (arrow 9).
8 Read the length from the tape attached to the board.
9 Record the measurement on the questionnaire (arrow 1).

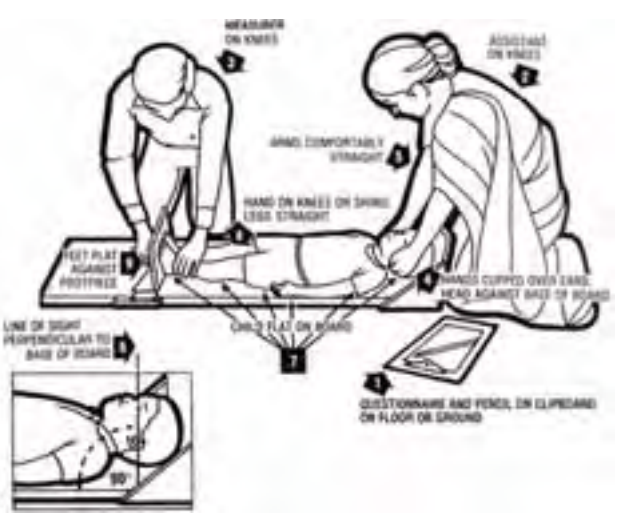


Figure 5.1 Measuring length. (Source: UNICEF, 1986, *How to weigh and measure children: assessing the nutrition status of young children*)

5.2.2 Height

This is measured with the child or adult in a standing position (usually children who are two years old or more). The head should be in the **Frankfurt position** (a position where the line passing from the external ear hole to the lower eye lid is parallel to the floor) during measurement, and the shoulders, buttocks and the heels should touch the vertical stand. Either a stadiometer or a portable anthropometer can be used for measuring. Measurements are recorded to the nearest millimetre.

Procedure

As with measuring a child's length, to measure a child's height, you need to have another person helping you. Figure 5.2 illustrates the procedures, and in Figure 5.3 you can see a young child having his height measured.

1 Both the assistant and measurer should be on their knees (arrows 2 and 3).
2 The right hand of the assistant should be on the shins of the child against the base of the board (arrow 4).
3 The left hand of the assistant should be on the knees of the child to keep them close to the board (arrow 5).
4 The heel, the calf, buttocks, shoulder and **occipital prominence** (prominent area on the back of the head) should be flat against the board (arrows 6, 7, 14, 13 and 12).
5 The child should be looking straight ahead (arrow 8).
6 The hands of the child should be by their side (arrow 11).
7 The measurer's left hand should be on the child's chin (arrow 9).
8 The child's shoulders should be levelled (arrow 10).
9 The head piece should be placed firmly on the child's head (arrow 15).
10 The measurement should be recorded on the questionnaire (arrow 1).

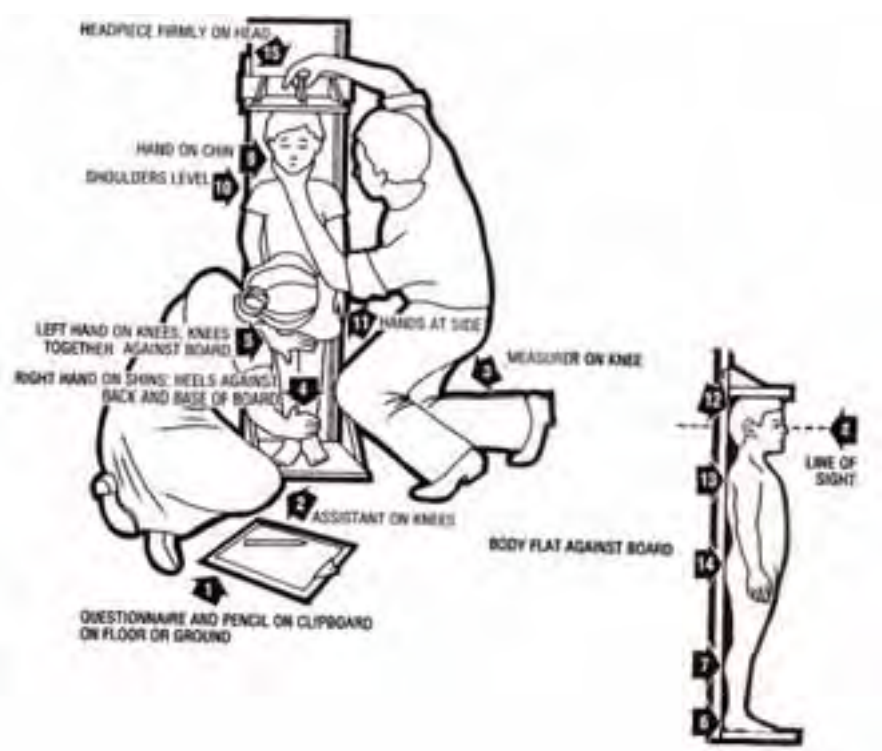


Figure 5.2 Measuring height. (Source: UNICEF, 1986, *How to weigh and measure children: assessing the nutrition status of young children*)

5.2.3 Weight

A weighing sling (spring balance), also called the '**Salter Scale**' is used for measuring the weight of children under two years old, to the nearest 0.1 kg. In adults and children over two years a beam balance is used and the measurement is also to the nearest 0.1 kg. In both cases a digital electronic scale can be used if you have one available. Do not forget to re-adjust the scale to zero before each weighing. You also need to check whether your scale is measuring correctly by weighing an object of known weight.

Procedures

In Figure 5.3 you can see the procedures for weighing a child under two years old using a Salter Scale. The photo in Figure 5.4 shows a small boy being weighted using the scale.

1 Adjust the pointer of the scale to zero level.
2 Take off the child's heavy clothes and shoes.
3 Hold the child's legs through the leg holes (arrow 1).
4 Hold the child's feet (arrow 2).
5 Hang the child on the Salter Scale (arrow 3).
6 Read the scale at eye level to the nearest 0.1 kg (arrow 5).
7 Remove the child slowly and safely.

Figure 5.4 Weighing a child using a harness and spring balance. (Photo: UNICEF Ethiopia / Indrias Getachew)

Figure 5.3 Measuring child's weight using the Salter Scale. (Source: UNICEF, 1986, *How to weigh and measure children: assessing the nutrition status of young children*)

Sometimes you will have to improvise. For example in the field set up, it is difficult to measure very young children who cannot sit by themselves using

the weighing pant attached to the scale. In addition, some children panic during the measurement and urinate, making the pant dirty. Therefore, mothers or caregivers may not be happy to let their children be measured in such a manner. The weighing scale with the pant can be improvised by using a plastic washing-basin which is attached to the Salter Scale and adjusting the reading to zero. You need to ensure the basin is as close to the ground as possible in case the child falls out, and to make the child feel secure during weighing. If the basin is dirty, then you need to clean it with a disinfectant. This is a much more comfortable and reassuring weighing method for the child and you can use it for ill children much more easily than the approaches described above.

- How do you know whether your weight measuring scale is correct?
- You can check the accuracy of the scale you're using by measuring an object of known weight.

Figure 5.5 Improvised way of measuring weight of the child using salter scale. (Source: UNICEF Ethiopia / Indrias Getachew)

5.2.4 Head circumference

The head circumference (HC) is the measurement of the head along the **supra orbital ridge** (forehead) anteriorly and **occipital prominence** (the prominent area on the back part of the head) posteriorly. It is measured to the nearest millimetre using flexible, non-stretchable measuring tape around 0.6cm wide. HC is useful in assessing chronic nutritional problems in children under two years old as the brain grows faster during the first two years of life. But after two years the growth of the brain is more sluggish and HC is not useful. In Ethiopia, HC is measured at birth for all newborn babies.

Now you have looked at how to take different measurements you are going to learn how the measurements are converted into different indices.

5.3 Converting measurements to indices

An index is a combination of two measurements or one measurement plus the person's age. The following are a few indices that you may find useful in your work:

Weight-for-age is an index used in growth monitoring for assessing children who may be underweight. You assess weight-for-age of all children under two years old when you carry out your community-based nutrition (CBN) activities every month.

Height-for age is an index used for assessing **stunting** (chronic malnutrition in children). 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 level. Stunting of children in a given population indicates the fact that the children have suffered from chronic malnutrition so much so that it has affected their linear growth.

Stunting is defined as a low height for age of the child compared to the standard child of the same age. Stunted children have decreased mental and physical productivity capacity.

Weight-for-height is an index used for assessing **wasting** (acute malnutrition).

Wasting is defined as a low weight for the height of the child compared to the standard child of the same height. Wasted children are vulnerable to infection and stand a greater chance of dying.

Body mass index is the weight of a child or adult in kg divided by their height in metres squared: Weight (kg)/(Height in metres)^2

Here is how to calculate each index for children in your community.

$$\text{Weight for age} = \frac{\text{Weight of the child}}{\text{Weight of the reference child of the same age}} \times 100$$

$$\text{Weight for height} = \frac{\text{Weight of the child}}{\text{Weight of the reference child of the same age}} \times 100$$

Birth weight is weight of the child at birth and is classified as follows:

more than 2 500 grams	=	normal birth weight
1 500–2 499 grams	=	low birth weight
less than 1 500 grams	=	very low birth weight

- How does stunting affect socioeconomic development?

- You have read that there are a number of ways that stunted children are at a disadvantage, even into their adult lives. They have poor physical and intellectual performance and are more likely to have a lower work output. This means that not only are they less productive at individual level, there are also poor socioeconomic outcomes at the population level.

5.3.1 What is an indicator?

An indicator is an index (for example, a scale showing weight for age, or weight for height) combined with specific cut-off values that help you determine whether a child is underweight or malnourished; for example, a child whose weight for age, or weight for height, falls below the cut-off values shown in Table 5.1 is considered to be underweight or malnourished.

You will be able to use anthropometric indicators to assess nutritional status, to evaluate the effects of interventions, to admit children to an intervention (treatment) programme and to discharge them from a programme. These indicators are therefore very important and knowing how to use them will help you plan effective nutrition interventions. Table 5.1 summarises the indices (column 1), cut-off values (column 2) and the nutritional problem that the cut-off values indicate (column 3).

Table 5.1 Indicators derived from the weight and height age of children and their cut-off values.

Index	Cut-off value based on standard deviation (SD)	What it indicates
Weight-for-age	Less than 2 and more than 3	Moderate underweight
Weight-for-age	Less than 3	Severe underweight
Weight-for-height	Less than 2 and more than 3	Moderate acute malnutrition (MAM)
Weight-for-height	Less than 3 and/or bilateral pitting oedema	Severe wasting
		Severe acute malnutrition (SAM)

Standard deviation (SD) is a measure showing how much variation there is from the average (mean) number in a set of values. So a low SD shows that the values in a set are not spread out very far from the mean. The more variation there is, the higher the SD.

- What is the indicator for diagnosing severe acute malnutrition?

□ Indicators for SAM are a child with standard deviation less than 3 and/or bilateral pitting oedema. If one of these signs is detected, the child is suffering from SAM.

5.4 Anthropometric measurements used to assess body composition

In assessing body composition (fat content) the body is considered to be made up of two compartments: the fat mass and the fat free mass. Therefore different measurements are used to assess these two compartments.

5.4.1 Measurements of fat-mass (fatness)

As you read earlier **Body Mass Index (BMI)** is the weight of a person in kilograms divided by their height in metres squared. A non-pregnant adult is considered to have a normal BMI when it falls between 18.5 and 25 kg/m^2. Table 5.2 shows you the different categories of nutritional status based on a person's BMI.

Table 5.2 Cut-off values for BMI for assessing adult nutritional status.

BMI(Kg/m2) cut-offs	Nutritional status
more than 40.0	Very obese
30.0–40.0	Obese
25–29.9	Overweight
18.5–24.9	**Normal**
17–18.49	Mild chronic energy deficiency
16–16.9	Moderate chronic energy deficiency
less than 16.0	Severe chronic energy deficiency

If an adult person has a BMI of less than 16 kg/m^2 they will not be able to do much physical work because they will have poor energy stores. In addition they will be at increased risk of infection due to impaired immunity.

Risk of mortality and morbidity is related to the nutritional status as assessed by the BMI. If people are too fat or too thin their health suffers. The risk of mortality and morbidity increases with a decrease in the BMI. Similarly, when the BMI increases to over 25 kg/m^2, the risk of mortality and morbidity increases. The relationship between BMI and risk of morbidity and mortality is shown in Figure 5.6.

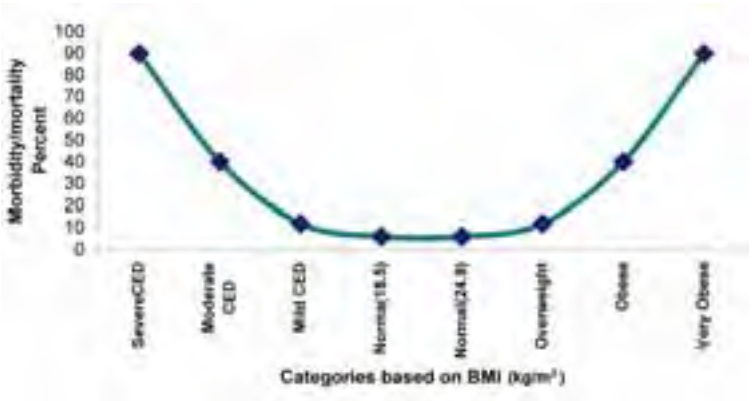


Figure 5.6 Relationship between BMI and morbidity and mortality.

- What are the problem associated with having high (greater than 25kg/m^2) or low (less than 18.5 kg/m^2) BMI?
- The risk of mortality and morbidity increases with a decrease in the body mass index. Similarly, when the body mass index increases over 25 kg/m^2, the risk of mortality and morbidity as well as other diseases such as hypertension, diabetes mellitus and cancer also increases.

5.4.2 Measuring fat-free mass (muscle mass)

An accurate way to measure fat-free mass is to measure the **Mid Upper Arm Circumference (MUAC).** The MUAC is the circumference of the upper arm at the midway between the shoulder tip and the elbow tip on the left arm. The mid-arm point is determined by measuring the distance from the shoulder tip to the elbow and dividing it by two. A low reading indicates a loss of muscle mass.

MUAC is a good screening tool in determining the risk of mortality among children, and people living with HIV/AIDS. MUAC is the only anthropometric measure for assessing nutritional status among pregnant women. It is also very simple for use in screening a large number of people, especially during community level screening for community-based nutrition interventions or during emergency situations.

MUAC is therefore used as a screening tool for community based nutrition programmes such as an outpatient therapeutic programme (OTP), for community-based interventions, supplementary feeding programmes and enhanced outreach programmes throughout Ethiopia. MUAC is also used for screening target children and pregnant women for severe acute malnutrition (SAM) and moderate acute malnutrition (MAM).

5.4.3 Measuring the MUAC of children

A special tape is used for measuring the MUAC of a child (see Figure 5.7). The tape has three colours, with the red indicating severe acute malnutrition, the yellow indicating moderate acute malnutrition and the green indicating

normal nutritional status. Figure 5.8 shows you how to use the tape to measure a child's MUAC.

Figure 5.7 MUAC measuring tape.

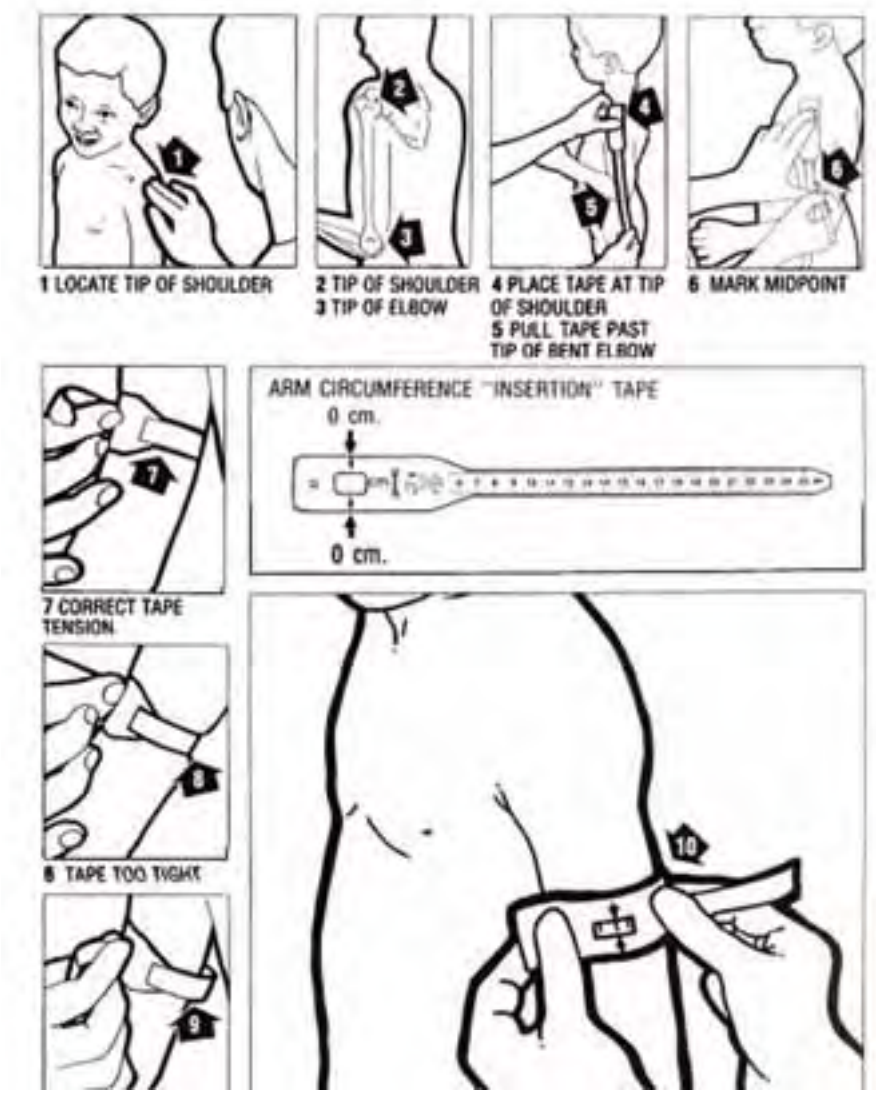


Figure 5.8 Measuring MUAC. (Source: UNICEF, 1986, *How to weigh and measure children: assessing the nutrition status of young children*)

Procedures for measuring MUAC

1 Ask the mother to remove any clothing that may cover the child's left arm. If possible, the child should stand erect and sideways to the measurer.

2 Estimate the midpoint of the left upper arm (arrow 6).

3 Straighten the child's arm and wrap the tape around the arm at the midpoint. Make sure the numbers are right side up. Make sure the tape is flat around the skin (arrow 7).

4 Inspect the tension of the tape on the child's arm. Make sure the tape has the proper tension (arrow 7) and is not too tight or too loose (arrows 8 and 9). Repeat any step as necessary.

5 When the tape is in the correct position on the arm with correct tension, read the measurement to the nearest 0.1 cm (arrow 10).

6 Immediately record the measurement.

You can see the MUAC of a young child being measured in Figure 5.9.

Figure 5.9 Measuring MUAC of a young child in Ethiopia. (Photo: AMREF Ethiopia)

Table 5.3 sets out the cut-off values using the MUAC measurement and how these relate to the level of malnutrition in children and adults.

Table 5.3 Cut-off points for screening in the community for SAM and MAM using MUAC

Target Groups	MUAC (in cm)	Malnutrition
Children under five	11–11.9	Moderate acute malnutrition (MAM)
	< 11 cm	Severe acute malnutrition (SAM)
Pregnant women/ adults	17–21 cm	Moderate malnutrition
	18–21 cm with recent weight loss	
	< 17 cm	Severe malnutrition
	< 18 cm with recent weight loss	

■ Why is MUAC a useful measurement tool?

□ There are a number of reasons. For pregnant women it is the only anthropometric measure that can give an accurate reading of their malnutrition status. Also, because MUAC can be measured quickly and easily, it is also used when screening large numbers of children and adults.

5.5 Clinical methods of assessing nutritional status

As a frontline health worker providing health services at community level, you will almost certainly encounter many people with nutritional deficiency problems. In addition to the anthropometric assessments, you can also assess clinical signs and symptoms that might indicate potential specific nutrient deficiency.

Clinical methods of assessing nutritional status involve checking signs of deficiency at specific places on the body or asking the patient whether they have any symptoms that might suggest nutrient deficiency from the patient. Clinical signs of nutrient deficiency include: pallor (on the palm of the hand or the conjunctiva of the eye), Bitot's spots on the eyes, pitting oedema, goitre and severe visible wasting (these signs are explained below).

5.5.1 Checking for bilateral pitting oedema in a child

In order to determine the presence of oedema, you should apply normal thumb pressure on both feet for three seconds (count the numbers 101, 102, 103 in order to estimate three seconds without using a watch). If a shallow print persists on both feet, then the child has nutritional oedema (pitting oedema). You must test for oedema with finger pressure (see Figure 5.10 below) because you cannot tell by just looking.

Figure 5.10 Checking for bilateral pitting oedema on a young child in Ethiopia. (Photo: UNICEF / Dr Tewoldeberhan Daniel)

Grades of oedema

Depending on the presence of oedema on the different levels of the body it is graded as follows. An increase in grades indicates an increase in the severity of oedema.

0 = no oedema

+ = Below the ankle (pitting pedal oedema)

++ = Pitting oedema below the knee

+++ = Generalized oedema.

5.5.2 Bitot's spots

These are a sign of vitamin A deficiency. Look at Figure 5.11 on the next page; as you can see, these spots are a creamy colour and appear on the white of the eye.

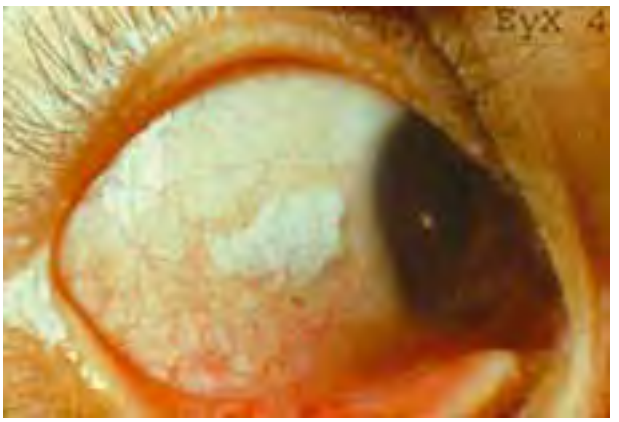


Figure 5.11 Bitot's spots (signs of vitamin A deficiency). (Photo: UNICEF Ethiopia)

5.5.3 Goitre

Goitre is a swelling on the neck and is the only visible sign of iodine deficiency (Figure 5.12).

Figure 5.12 Goitre in an Ethiopian woman. (Photo: Linkages/AED, 2005, Control of Iodine Deficiency Disordes (IDD) in Ethiopia)

5.5.4 Visible severe wasting

In order to determine the presence of visible severe wasting for children younger than six months, you will need to ask the mother to remove all of the child's clothing so you can look at the arms, thighs and buttocks for loss of muscle bulk. Sagging skin and buttocks indicates visible severe wasting (as you can see in Figure 5.13).

Figure 5.13 A child with severe visible wasting. (Source: Ethiopian Federal Ministry of Health, 2010, *Training course of the out patient treatment programme of severe acute malnutrition*)

Table 5.4 summarises the main symptoms of nutritional problems and the deficiencies they signal.

Table 5.4 Clinical signs and symptoms of nutritional problems.

Sign/symptom	Nutritional abnormality
Pale: palms, conjunctiva, tongue Gets tired easily; loss of appetite shortness of breath	Anaemia: may be due to the deficiency of iron, folic, vitamin B12, acid, copper, protein or vitamin B6
Bitot's spots (whitish patchy triangular lesions on the side of the eye)	Vitamin A deficiency
Goitre (swelling on the front of the neck)	Iodine deficiency disorder

- Aster is a one-year-old girl who was brought to your health post by her mother, with a complaint of body swelling and poor appetite for one month.

  Upon anthropometric assessment her weight-for-height was less than 3 SD and on examination, she has bilateral pitting oedema. What is the nutritional problem Aster is suffering from and what are the indicators?

- Aster's weight-for-height index is an indicator of severe underweight and this, combined with the bilateral pitting oedema, tells you that she has severe acute malnutrition.

5.6 Dietary methods of assessing nutritional status

Dietary methods of assessment include looking at past or current intakes of nutrients from food by individuals or a group to determine their nutritional status. You can ask what the family or the mother and the child have eaten over the past 24 hours and use this data to calculate the dietary diversity score.

Dietary diversity is a measure of the number of food groups consumed over a reference period, usually 24 hours. Generally, there are six food groups that our body needs to have everyday. These can be represented in the food guide pyramid which you read about in Study Session 2 and which is reproduced in Figure 5.14 overleaf.

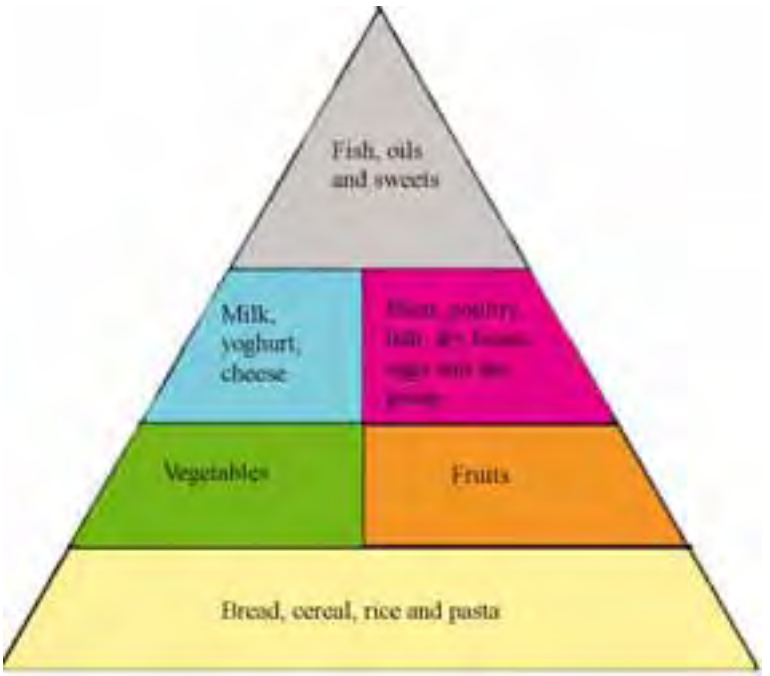


Figure 5.14 Food guide pyramid.

You may recall from Study Session 2 the base or widest part of the pyramid indicates the need for higher quantities of consumption of carbohydrate source foods, while the tip is narrow, indicating the need for eating only small amounts of fats and sweet things. If a person consumes any examples of the food type from each of the six groups in 24 hours, we can say that their dietary diversity score is six. Dietary diversity score is an indicator of both the **balance of nutrient consumption** and the level of food security (or insecurity) in the household. The higher the dietary diversity score in a family, the more diversified and balanced the diet is and the more food-secure the household.

As part of the dietary assessment you should also check the salt iodine level of households using the single solution kit (SSK). This enables you to determine whether the salt iodine level is 0, more than 15 parts per million (PPM) or less than 15 PPM. You can see a photo of an SSK in Figure 5.15. Normally, an iodized salt should have iodine level of more than 15 PPM to be effective in preventing iodine deficiency and its consequences. As a Level IV Health Extension Practitioner you are expected to test the iodine level of household salts twice a year.

Figure 5.15 Testing salt iodine level using an SSK. (Photo: UNICEF Ethiopia / Dr Tewoldeberhan Daniel)

You can use the various methods of assessing nutritional status discussed in this study session to evaluate the nutrition status of people living in your community. Whichever measurements you are taking you should remember that it is important to follow procedures correctly and take accurate measurements that ensure the quality of data generated about the individuals you are responsible for in your community.

Summary of Study Session 5

In Study Session 5 you have learned that:

1 Nutritional assessment is the interpretation of data to determine whether a person or groups of people are well nourished or malnourished (over nourished or under-nourished).

2 Anthropometry is the measurement of physical dimensions such as height or weight, as well as the fat mass composition of the human body to provide information about a person's nutritional status.

3 An index is a combination of two anthropometric measurements or an anthropometric measurement plus age. An indicator is a combination of an index and a cut-off point.

4 There are procedures for measuring length, height, weight and MUAC.

5 Weight-for-age is an index used to assess child growth.

6 MUAC is used for community-based screening of children who are less than five years old and for pregnant women. Knowing the MUAC can help when assessing severe acute malnutrition and moderate acute malnutrition.

7 Body mass index is the best measure of non-pregnant adult nutritional status.

8 Bilateral oedema and the different grades of oedema are checked on the top of the foot and around the ankle using both hands and pressing each foot for three seconds. Its presence indicates severe acute malnutrition.

9 Clinical signs and symptoms, such as goitre or Bitot's spots, are also important indicators of micronutrient deficiencies.

10 Checking for the iodine level of salt in households is done by using a single solution kit, and should be done twice yearly.

Self-Assessment Questions (SAQs) For Study Session 5

Now that you have completed the study session, you can assess how well you have achieved its Learning Outcomes by answering these questions. Write your answers in your Study Diary and discuss them with your Tutor at the next Study Support Meeting. You can check your answers with the Notes on the Self-Assessment Questions at the end of the Module.

SAQ 5.1 (tests Learning Outcome 5.1)

What is nutritional assessment used for? Name the different ways in which it can be carried out.

SAQ 5.2 (tests Learning Outcomes 5.1 and 5.2)

What is the difference between an anthropometric index and an indicator?

SAQ 5.3 (tests Learning Outcomes 5.2 and 5.3)

What kinds of things can be measured to make a nutritional assessment?

SAQ 5.4 (tests Learning Outcomes 5.3 and 5.4)

Describe some of the different methods you could use to determine whether a child is suffering from severe acute malnutrition.

SAQ 5.5 (tests Learning Outcome 5.3)

What are the anthropometric indicators of moderate acute malnutrition in:

1 Children
2 Pregnant women

SAQ 5.6 (tests Learning Outcome 5.5)

What nutrient deficiency do the following clinical signs/symptoms indicate?

(a) Pallor
(b) Goitre
(c) Bitot's spots
(d) Bilateral pitting oedema
(e) Severe visible wasting

Study Session 6 Common Nutritional Problems in Ethiopia

Introduction

In this study session you are going to learn about common nutritional problems that are of public health importance in Ethiopia. In Study Session 5 you learned how to assess the nutritional status of children and adults. You are now going to look at how to use the knowledge and skills you learnt in that study session to identify children and adults with nutritional problems.

You will also learn about acute and chronic malnutrition in the community and something about their causes. 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.

Learning Outcomes for Study Session 6

When you have studied this session, you should be able to:

6.1 Define and use correctly all of the key words printed in **bold**. (SAQs 6.1 and 6.2)

6.2 Summarise the magnitude and types of nutritional problems in Ethiopia. (SAQ 6.1)

6.3 List the common causes of malnutrition in children using a conceptual framework. (SAQ 6.2)

6.4 Describe the consequences of malnutrition to the community. (SAQ 6.4)

6.5 List the strategies to promote proper nutrition in the community. (SAQ 6.3s and 6.4)

6.1 Types of malnutrition

Malnutrition is a general term that includes many conditions, including undernutrition, overnutrition and micronutrient deficiency diseases (like vitamin A deficiency, iron deficiency anaemia, iodine deficiency disorders and scurvy).

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. Figure 6.1 shows a child with undernutrition.

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. It is the indicator used to monitor the Millennium Development Goal (MDG) of

Figure 6.1 A mother and child with undernutrition. (Photo: UNICEF Ethiopia)

ending hunger, and targets of halving the prevalence of underweight children and adults by 2015.

- Which type of malnutrition is a result of recent food insecurity or illness?

- Wasting (thinness) is the result of recent food insecurity or illness such as diarrhoea or infection.

Look at Figure 6.2 carefully. You can see that Ethiopia has a high rate of stunting (chronic malnutrition). Forty seven percent of children under five years of age are considered to be stunted and this is the fourth highest percentage in Africa.

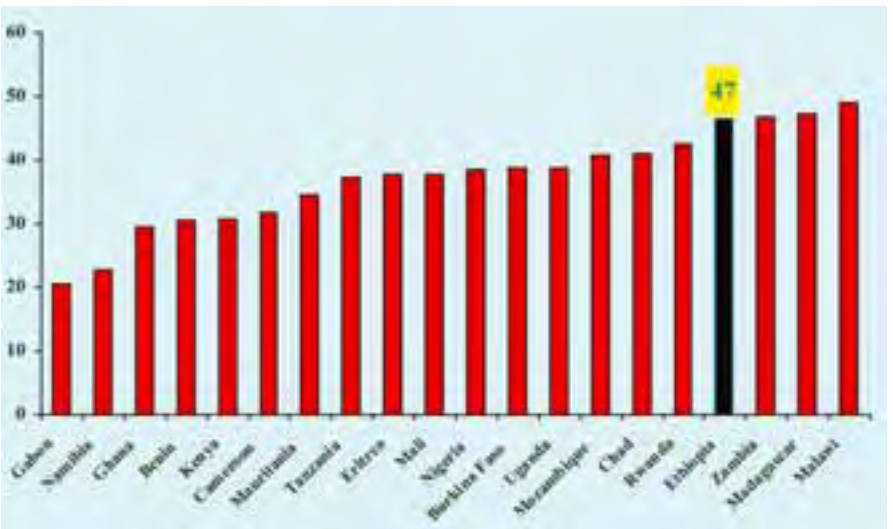


Figure 6.2 Prevalence of stunting in children under five, in selected African countries. (Source: AED/Linkages)

6.2 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). The 2005 Demographic Health Survey (DHS) has shown that about 47 % and 11% of Ethiopian children under five years of age were stunted and wasted respectively. Thirty eight percent of children under five years of age were underweight and 11% were severely underweight.

Malnutrition is also very high amongst women. One in four women (27%) in Ethiopia are thin i.e. they have body mass index of less than 18.5 (Ethiopian Demographic Health Survey of 2005).

- What are the major forms of malnutrition that are common in Ethiopia?

- The common forms of malnutrition in Ethiopia include acute and chronic malnutrition, iron deficiency anemia (IDA), vitamin A deficiency (VAD), and iodine deficiency disorder (IDD).

According to the DHS, the prevalence of low birth weight (LBW) in Ethiopia is one of the highest in the world, and has been estimated to be 14%. Based

on mother's subjective assessment of the size of the baby at birth, 21% of births were reported to be very small and 7% were reported as smaller than average. One major contributing factor for LBW is the poor nutritional status of women both before and during pregnancy, made worse by inadequate weight gain during pregnancy (DHS).

6.3 Classification of malnutrition

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

In the past, severe acute malnutrition was classified in the way described in Box 6.1 and Figures 6.3 and 6.4 overleaf. You need to know this, because you may come across people who still use these terms.

Box 6.1 Previous classifications of severe acute malnutrition

Protein-energy-malnutrition (PEM): A clinical syndrome present in infants and children as a result of deficient intake and/or utilisation of food.

Marasmus: Severe form of acute malnutrition that is characterised by wasting of body tissues. Marasmic children are extremely thin. (Figure 6.3)

Kwashiorkor: Severe form of acute malnutrition characterised by bilateral oedema and weight-for-height of greater or equal to -2 SD (Figure 6.4)

Marasmic-Kwashiorkor: Severe form of acute malnutrition characterised by bilateral oedema 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**.

6.4 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, 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.

Figure 6.3 A child with Marasmus. Figure 6.4 A child with Kwashiorkor.

(Photos: Federal Ministry of Health, March 2006, *Enhanced outreach services for child survival interventions*)

Activity 6.1 Identifying causes of malnutrition in your community

Select a few neighbours or other people from your community and discuss with them what they think may be the possible causes of any malnutrition that can be found in your area (see Figure 6.5). Document your discussions and possible causes in your Study Diary and discuss your findings with your Tutor.

Figure 6.5 Group discussion to identify causes of malnutrition.

Now you will learn more about the causes of malnutrition using a way of looking at the problem that will help you identify its various underlying reasons.

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.

Look carefully at Figure 6.6. You will see that the causes of malnutrition have been divided into three main headings: the basic causes; the underlying causes; and the immediate causes.

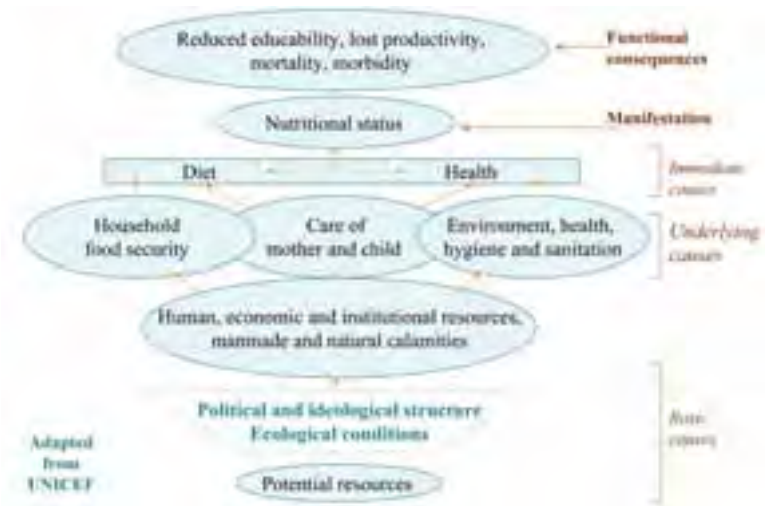


Figure 6.6 Causes and consequences of malnutrition.

You are now going to look at each of these causes in more detail.

6.4.1 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 breastmilk; 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.

Look at Figure 6.7 (the malnutrition–infection cycle). This shows the relationship between infection and undernutrition. As you can see from the figure, infection will lead to undernutrition and the undernutrition also leads to infection.

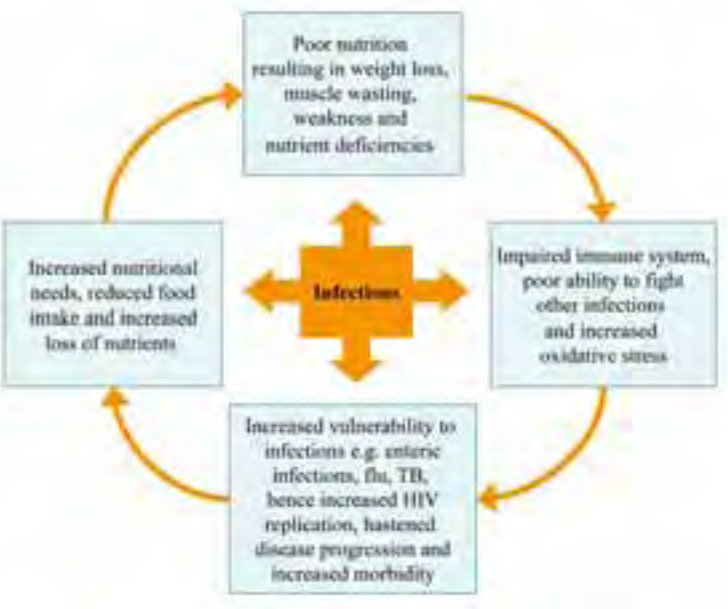


Figure 6.7 The malnutrition-infection cycle.

6.4.2 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 over-cultivation 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.

Activity 6.2 Identifying local causes of family food shortages

Think of a family in your community who has food shortages and discuss with a work colleague what the reasons for the food shortages could be. Make a note of these in your Study Diary and discuss your findings with your Tutor.

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.

Activity 6.3 Effects of women's activity on nutritional status of children

Discuss with some of your colleagues how the mothers in your community spend their time. Discuss how their activities affect the nutritional status of their children. Write down your discussion points in your Study Diary and discuss these with your Tutor.

Mothers may spend much of 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.

6.5 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.

6.5.1 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.

6.5.2 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 nutrition.

6.5.3 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.

6.5.4 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.

6.6 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. Yet, data available (DHS 2005) now indicates that, in Ethiopia, malnutrition starts very early in life for large numbers of children who become progressively more malnourished during the first two years of life. 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 breastmilk.

Just as malnutrition has many causes, its effects are also multidimensional in nature.

6.6.1 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.

6.6.2 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.

6.6.3 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.

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.

6.6.4 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.

6.6.5 Intergenerational cycle of malnutrition

As you read earlier, malnutrition has an intergenerational cycle. A malnourished mother will give birth to a low birth weight baby; the low birth weight baby will grow as a malnourished child, then to a malnourished teenager, then to a malnourished pregnant woman, and so the cycle continues. This is illustrated in Figure 6.8.

6.7 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 Extension Practitioner 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:

- Basic education
- Healthy environment
- Maternal and child care

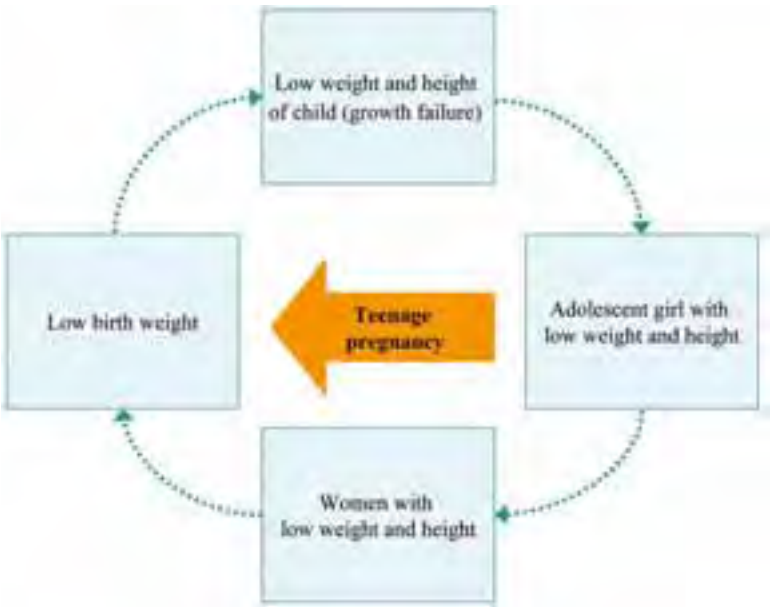


Figure 6.8 Intergenerational cycle of malnutrition.

- Healthy social and family life
- Proper agriculture
- Public health measures.

As a Health Extension Practitioner you have a role to play in all of these strategies.

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.

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.

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.

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.

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.

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 are 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.

Summary of Study Session 6

In Study Session 6 you have learned that:

1 Malnutrition includes a wide range of clinical disorders resulting from an unbalanced intake of energy, protein or other nutrients. It can present as under or overnutrition. Malnutrition is one of the main health problems facing women and children in Ethiopia.

2 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).

3 Inadequate food intake, diseases like measles, food insecurity and limited access to foodstuffs, plus poor sanitation and inadequate health services, and inadequate maternal and childcare practices are the commonest causes of malnutrition.

4 The consequences of malnutrition include an increased risk of diseases and death, poor productivity of the malnourished individuals as well as poor academic performance and loss of attendance of children from school. Other consequences are poverty perpetuation (a vicious circle) and an intergenerational cycle of malnutrition.

5 The strategies to prevent malnutrition include advocating for equal access to education for both boys and girls, and creating a healthy environment. The provision of proper antenatal care, safe delivery and postnatal care services are also important. Encouraging the use of family planning methods, prevention and treatment of infections of pregnant mothers, and babies and immunization of children and pregnant women are among other useful strategies for addressing malnutrition.

Self-Assessment Questions (SAQs) for Study Session 6

Now that you have completed this study session, you can assess how well you have achieved its Learning Outcomes by answering these questions. Write your answers in your Study Diary and discuss them with your Tutor at the next Study Support Meeting. You can check your answers with the Notes on the Self-Assessment Questions at the end of this Module.

First read case study 6.1.

6.1 Chaltu's story

Chaltu is two years old. She was brought to you because she has had diarrhoea for the last two weeks. You took anthropometric measurements; her weight is 7 kg, her height is 80cm, and her MUAC is 10.5cm. You found pitting oedema of both legs.

When you asked Chaltu's mother about the family situation, the mother told you that Chaltu is the seventh child in the family. The family owns only one hectare of land and the land is not fertile.

SAQ 6.1 (tests Learning Outcomes 6.1 and 6.2)

What is the nutritional status of Chaltu? Is Chaltu malnourished? Explain how you have come to your answer.

SAQ 6.2 (tests Learning Outcomes 6.1 and 6.3)

What do you think are the immediate, underlying and basic causes of Chaltu's malnutrition?

SAQ 6.3 (tests Learning Outcome 6.5)

List the strategies you will use for Chaltu's family in order to promote proper nutrition in this family.

SAQ 6.4 (tests Learning Outcomes 6.4 and 6.5)

What is the impact of malnutrition on communities? How can you help prevent some of the negative effects of malnutrition?

Study Session 7 Preventing Micronutrient Problems in Ethiopia

Introduction

As well as having a diet with a balance of fats, carbohydrates and proteins, the health and **vitality** of all human beings depends on a diet that includes adequate amounts of vitamins and minerals. These are the '**micronutrients**' that are necessary to help the body in all its functions, including reproduction, and to make sure that it can fight infection. People need micronutrients so they can use their brains and have the energy to keep their body working as well as possible. Your job as a Health Extension Practitioner will involve helping people to understand the importance of these components in a diverse diet. Among these micronutrients, three have obtained worldwide attention due to their high public health significance. If people don't get sufficient vitamin A, iodine and iron, this can lead to grave health as well as social and economic consequences.

In this session you will learn more about these micronutrients, as well as the extent and consequences of their deficiency. You will also learn how to prevent and treat the major micronutrient deficiencies in your community.

Learning Outcomes for Study Session 7

When you have studied this session, you should be able to:

7.1 Define and use correctly all of the key words printed in **bold**. (SAQ 7.1)

7.2 Recognise the magnitude of micronutrient deficiencies in Ethiopia. (SAQ 7.1)

7.3 Identify those at risk of developing vitamin A deficiency. (SAQ 7.2)

7.4 Identify children with anaemia and those at risk of developing anaemia. (SAQ 7.3)

7.5 Recognise people with iodine deficiency disorder (IDD) and those at risk of developing IDD. (SAQ 7.3)

7.6 Identify the causes and consequences of iron deficiency. (SAQ 7.3)

7.7 Understand some of the methods that you will be able to use in your own community to prevent and treat these common micronutrient deficiencies. (SAQ 7.4)

7.1 The importance of micronutrients

Earlier, in Study Session 2, you looked at micronutrients and their sources, and you learned that people's health and vitality depends on a diet that includes adequate amounts of vitamins and minerals to keep the body functioning efficiently. *Vitamins* are necessary in small amounts in our diet to facilitate growth, maintenance of health and reproduction. *Minerals* do not originate in animal or plant life but come from the earth. Although minerals make up only a small portion of body tissues, they are essential for normal growth and functioning.

Because only very minute quantities of vitamins and minerals are needed for health, they are called **micronutrients**. These elements are essential; they cannot be manufactured by the human body and must be obtained through

dietary means. Among these micronutrients, three have obtained worldwide attention and are the focus of this study session due to their high public health significance. Vitamin A, iodine and iron deficiencies lead to grave health, social and economic consequences; but the good news is that there are cost-effective strategies to overcome these deficiencies.

■ What role do you think that village level health workers could have in helping their communities avoid micronutrient deficiencies?

□ Village health workers such as yourself can encourage families to grow the right sort of foods, and to attend and bring their children to supplementation and treatment services. You can also work with the women in your village to help identify potential problems and families who need support.

The overall goals and objectives of the prevention and treatment of micronutrient deficiencies in Ethiopian are shown in Box 7.1.

Box 7.1 Overall goals and objectives of the prevention and treatment of micronutrient deficiencies in Ethiopia

Goal: to achieve virtual elimination of micronutrient deficiencies in Ethiopia by 2015.

Objectives:

- To increase coverage of the programmes that improve the micronutrient status of the population
- To develop standards for national programmes
- To provide reference materials and aids to health care professionals.

7.2 Vitamin A, iodine and iron deficiencies in Ethiopia

Vitamin A deficiency (VAD) is a severe public health problem in Ethiopia affecting around 61% of children 6–59 months of age in the 11 regions of the country (DHS, 2005). The situation is probably worse in emergency affected areas. Clinical vitamin A deficiency, untreated can lead to childhood blindness and it is likely that vitamin A deficiency is one of the major contributing factors to the high under-five mortality rate of Ethiopia (174 per 1000, UNICEF).

Globally, 30% of the world's population is affected with iodine deficiency disorder (IDD). In Ethiopia, one out of every 1000 people is affected and about 50,000 prenatal deaths occur yearly due to iodine deficiency disorder. As you read in Study Session 1, the rate of goitre (caused by iodine deficiency) in Ethiopia is at emergency levels according to WHO standards. This is in part because of the marked decrease in the amount of iodised salt being consumed in Ethiopian households compared with a decade ago. About 685,000 babies are born to mothers with IDD and as a result stand a risk of suffering from some degree of learning disability.

Anaemia is a widespread health problem affecting more than two billion people worldwide — one third of the world's population. More than half

(54%) of Ethiopian children age 6–9 months and 27 % of Ethiopian women aged 15–49 are anaemic (mainly due to low blood iron status).

The consequences of anaemia are multiple. Iron deficiency can delay muscular and nervous system development and mental performance, especially in preschool age children. In adults, anaemia reduces work capacity, mental performance and reduces tolerance to infections. Iron deficiency anaemia can also cause increased maternal mortality due to bleeding problems. Maternal anaemia can lead to prenatal infant loss, low birth weight, and pre-term births.

■ How could you find out if there are any people in your community with micronutrient deficiencies?

□ There are a number of potential sources of information you might have listed, for example you could:

- Ask teachers if there are children who miss school (children with anaemia may be too tired to attend)
- Ask family members if there are mothers and children who find it difficult to see after dusk and if children frequently get sick (possible signs of vitamin A deficiency)
- Ask community leaders/families if there are any children/adolescents who have swelling in front neck area (goitre: a sign of iodine deficiency).

7.3 Rationale for action against vitamin A, iron and iodine deficiencies

Ethiopia has developed a National Nutrition Strategy, and a National Nutrition Programme (NNP) was launched in September 2008. This NNP sets out the need for tackling vitamin A, iron and iodine deficiencies.

7.3.1 Rationale for action against vitamin A deficiency

Action against vitamin A deficiency is important, because improving a child's vitamin A status:

- increases their chance of survival
- reduces the severity of the childhood illness
- prevents night blindness/blindness and may reduce birth defects
- is very cost-effective.

Improving a child's vitamin A status is a cost-effective way of improving their health.

7.3.2 Rationale for action against iodine deficiency

- Universal salt iodisation (USI) can lead to an increase of the average intelligence of the entire school age population by as much as 13 points
- Salt iodisation will improve the physical and mental development of millions of people
- The intellectual and cognitive development of whole generations of Ethiopian children will be reduced by around 10% unless adequate iodine is provided.

7.3.3 Rationale for action against iron deficiency anaemia

Control of anaemia will:

- Decrease maternal mortality

- Decrease premature birth, inter-uterine retardation and low birth weight
- Decrease infant mortality (due to low birth weight)
- Increase capacity to learn
- Increase productivity in all individuals.

7.4 Causes of vitamin A, iron and iodine deficiencies

Vitamin A deficiency (VAD) results when body stores are used up either because too little vitamin A is present in the foods, or there is insufficient absorption of vitamin A from foods. For example, if a diet is lacking in oils or fats, vitamin A is not well absorbed and utilised. VAD can also result from rapid utilisation of vitamin A during illnesses (particularly measles, diarrhoea and fevers), pregnancy and lactation, and during phases of rapid growth in young children. If the vitamin A status in the body is very low:

- The immune systems become weak and illness is more common and more severe, increasing under-five death rates
- The eye could be damaged with appearance of lesions, and when severe, blindness can occur
- There is an increased risk of a woman dying during pregnancy or during the first three months after delivery.

Iodine is found naturally in topsoil, but in most areas of the country and especially the highlands, top soil has been lost due to deforestation, erosion and flooding, and thus food crops lack iodine resulting in dietary iodine deficiency.

Anaemia has multiple causes. Its direct causes can be broadly categorised as poor, insufficient or abnormal red blood cell production, excessive red blood cell destruction, and excessive red blood cell loss. Contributing causes include poor nutrition related to dietary intake and dietary quality (iron deficiency in particular), infectious and parasitic diseases; inadequate sanitation and health behaviours; lack of access to health services; and poverty. The two major direct causes of anaemia, with excessive red cell destruction, are malaria and worm infections.

The NNP and the Health Sector Development Plan IV have a number of programme objectives and targets and these are set out in Tables 7.1 and 7.2 overleaf.

Table 7.1 Population at risk of vitamin A, iodine and iron deficiencies.

Vitamin A deficiency	Iodine deficiency disease	Iron deficiency anaemia
Infants and children under five and pregnant and lactating women	People of all ages and sexes are vulnerable More at risk are the fetus, young children, pregnant women, and lactating mothers	Low birth weight infants Children aged six–24 months Adolescent girls Pregnant and lactating women Children between six and 11 years of age People living with HIV and AIDS

Table 7.2 Goals for controlling vitamin A, iodine and iron deficiencies.

Vitamin A deficiency	Iodine deficiency disease	Iron deficiency anaemia
Goal: to virtually eliminate vitamin A deficiency by the year 2015 Objectives: At least 90% of children 6–59 months given vitamin A every six months (all the country except Addis Ababa) Supplement 70% of postpartum women with high doses of vitamin A within 45 days of delivery	Goal: Virtual elimination of iodine deficiency disorders by the year 2015 by means of universal salt iodisation (USI) Objectives: Decrease current goitre rate by 50%. Increase access to iodised salt among households up to 80%	Goal: Virtual elimination of ion deficiency amaemia Objectives: Reduce the prevalence of ion deficiency anaemia in women of reproductive age and children under five, by one third by 2015

7.5 Strategies to control vitamin A, iodine and iron deficiencies

As a Health Extension Practitioner, the strategies and activities outlined in the national strategies will be carried out by you with the help of village Community Health Workers and supervisors.

7.5.1 Strategies for the control of vitamin A deficiency

The main strategies which have been adapted globally to control and eliminate vitamin A deficiency are explained below:

Promote and support exclusive breastfeeding up to six months of age

As you read in earlier study sessions, breastmilk protects infants in their first six months against infectious diseases that can deplete vitamin A stores and interfere with vitamin A absorption. The vitamin A intake of a breastfed child depends on the vitamin A status of the mother, the stage of lactation, and the quantity of breastmilk consumed. From birth to about six months of age, exclusive, frequent breastfeeding can provide the infant with all the vitamin A needed for optimal health, growth and development. Therefore, exclusive breastfeeding until six months of age helps ensure sufficient vitamin A intake. Figure 7.1 below shows a poster that advertised the importance of breastfeeding for young babies.

Figure 7.1 Picture of a mother breastfeeding her baby. (Federal Ministry of Health, 2010, Poster for Breastfeeding Week)

Vitamin A supplementation (VAS)

Supplementation is a low-cost and highly effective means of improving vitamin A status, and the quickest intervention that can be implemented on a national scale.

- Vitamin A capsules given twice yearly at six months intervals to children 6 to 59 months is protective, and sufficient for a child's requirement
- Vitamin A capsules given to postpartum mothers within 45 days after delivery increases the amount of the vitamin A in the breastmilk and therefore the infant's intake of vitamin A.
- Dietary approaches are also important and include:
  - **Fortification** which is the process of adding vitamin A to foods commonly consumed by vulnerable population. It is an effective and sustainable strategy to combat vitamin A deficiency
  - As well as breastfeeding, home gardens are also an essential component of vitamin A deficiency reduction programmes.

7.5.2 Estimating vitamin A supplements requirements

If you do not have a census or register with the total number of children in your catchment area, use the following national statistics to plan how many vitamin A supplies you need for your community:

- 2% of the total population as an estimate for the number of children six–11 months
- 14% of the total population as an estimate for the number of children 12–59 months.

An additional 10% is always added for wastage.

You should order enough supplies for follow-up doses every four to six months through routine services.

Doses and schedules for vitamin A supplements

Vitamin A supplementation should be given to those at risk using the amounts given in the table below.

Table 7.3 Vitamin A supplementation for children.

Age	Dose	Frequency
Children 6–11 months	100,000 IU (one capsule of 100,000 IU)	Once
Children 12–59 months	200,000 IU (two capsules of 100,000 IU)	Once every four to six months
Postpartum women	200,000 IU (three capsules of 100,000 IU)	Within 45 day after delivery

7.5.3 Administering vitamin A supplements safely using a capsule

Giving a child vitamin A using a capsule can be done easily and safely if you follow these steps:

- Check the age of the child
- Ask the caregiver if the child has received vitamin A capsule in the last month. If the answer is yes, you do not need to give the child vitamin A at this time
- If the answer is no, ask the caregiver to hold the child firmly and make sure the child is calm
- Give the appropriate dose of vitamin A to the child:
  - 100,000 IU to child 6–11 months
  - 200,000 IU to child 12–59 months.
- Cut the nipple of the capsule at the middle (not at the tip or bottom) with scissors and immediately squeeze the drops of liquid into the child's mouth (see Figure 7.2)
- Check if the child is comfortable after swallowing the drops
- Put all capsules that have been used into a plastic bag
- Wipe your hands to clean off the drops of oil
- Record the dose given on the tally sheet.

Do not put the vitamin A capsule into the child's mouth or allow the child to swallow the capsule.

Do not give a vitamin A capsule if the child has already received a dose within the last month.

Do not give a vitamin A capsule to any woman of reproductive age during an Enhanced Outreach Strategy Programme. A large dose of vitamin A supplements can damage the fetus if the woman is pregnant.

Figure 7.2 Administering vitamin A capsule to an infant. (Photo: UNICEF/ Pirozzi, taken from the Linkages project 'Nutrition in Ethiopia', Federal Ministry of Health, 2010)

7.5.4 Choking after a vitamin A dose

If an infant or child starts choking when you administer the vitamin A dose you should do the following:

For infants:

- Lay the infant on your arm or thigh in a head down position
- Give five blows to the infant's back with heel of hand
- If obstruction persists, turn the infant over and give five chest thrusts with two fingers, one fingerbreadth below nipple level in midline (see Figure 7.3).

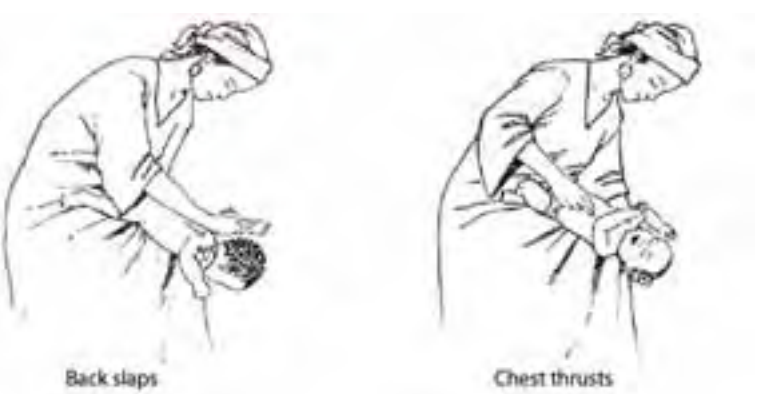


Figure 7.3 Resuscitation method to overcome choking for infants.(Source: Federal Ministry of Health, March 2006, *Guidelines for the enhanced outreach strategy (EOS) for child survival interventions*)

For children:

- Give five blows to the child's back with heel of hand with child sitting, kneeling or lying
- If the obstruction persists, go behind the child and pass your arms around the child's body; form a fist with one hand immediately below the child's breast bone (sternum); place the other hand over the fist and pull upwards into the abdomen; repeat this **Heimlich manoeuvre** five times (see Figure 7.4)
- If the obstruction persists, check the child's mouth for any obstruction, which can be removed
- If necessary, repeat this sequence with backslaps again.

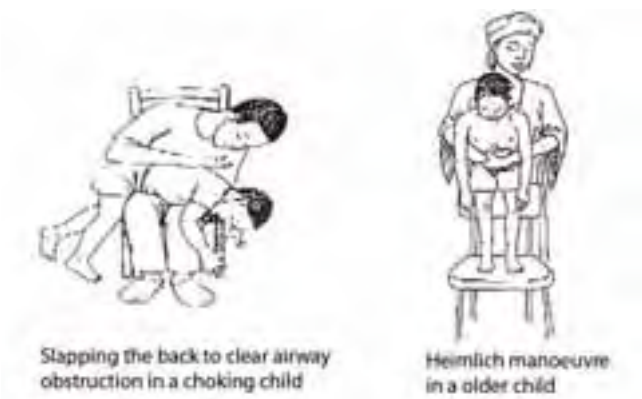


Figure 7.4 Resuscitation method to overcome choking in children. (Source: Federal Ministry of Health, March 2006, *Guidelines for the enhanced outreach strategy (EOS) for child survival interventions*)

Table 7.4 below is a summary of the different symptoms you might observe as side effects of vitamin A administration, which include overdose and accidental choking. It also describes how you can prevent these from happening and what actions you need to take to overcome these problems if they occur.

Table 7.4 Potential problems of vitamin A administration.

	Symptoms	**Preventable?**	**Action required**
Side-effect	Headache, loss of appetite, vomiting or a bulging fontanel (in infants)	NO, it happens with approx. 5% of children	Advise the parent that this is normal, symptoms will pass and no medical treatment is necessary
	Not harmful		
Overdose	Vomiting and lethargy/ listlessness	YES, if protocol is followed	Refer for medical treatment
	Only occurs if child takes multiple doses together		Report
Choking	Accidental blocking of trachea	YES, if proper administration of the vitamin A dose is carried out	Resuscitation
			Report

7.5.5 Dietary diversification and modification for Vitamin A

As well as the strategies you read about in 7.5.1, there are longer-term and more sustainable interventions for the prevention of vitamin A deficiency. As a Health Extension Practitioner, you are expected to encourage family members to grow and consume vitamin A rich foods at all times. This requires input from several of your colleagues, such as the development agents, teachers, local administration and local NGOs. You can initiate and coordinate the establishment of horticultural demonstration gardens in health post and schools, as well as agricultural extension demonstration plots in farming areas. These horticultural gardens can also serve as examples for dissemination of information on the use of fruits and vegetables, and the distribution of seedlings that could be grown around rural homes. Health Extension Practitioners can therefore play a significant role in promoting the introduction of vitamin A rich foods and improving consumption and storage of such foods. Box 7.2, describes foods that are good sources of vitamin A and in Figure 7.5 you can see photos taken during a visit to a women's project where food is being produced for their village.

Box 7.2 Examples of food sources rich in vitamin A.

Animal sources of Vitamin A

- The best food sources are animal foods such as egg yolks, organ meats such as liver, whole milk and milk products, small fish with the liver intact, fish, cod liver oil, butter, and ghee.
- The best source of vitamin A for infants is breastmilk. The mother's secretion of vitamin A into breastmilk is related to her own vitamin A status.

Plant Sources of Vitamin A

- The best plant sources of vitamin A are dark orange or dark yellow fruits and vegetables such as papayas, mangos, pumpkins, carrots, and yellow or orange sweet potatoes, and dark green vegetables such as spinach and kale
- '*Gommen*' is an example of a traditional plant which is rich in vitamin A and commonly included in the Ethiopian diet.

Figure 7.5 Pictures taken during a visit to women's income generating project supported by USAID.

Food fortification

This involves adding one or more vitamins and minerals to commonly consumed foods, especially those for children, with the purpose of preventing or correcting a demonstrated deficiency. It is difficult to fortify foods in Ethiopia because no staple food has been identified as widely consumed in the entire country. However, efforts are underway to fortify oils that are being produced in some of the larger factories.

7.5.2 Strategies for the control of Iodine deficiency

The main strategies to control and eliminate iodine deficiency are the following:

Universal iodisation of salt for human and animal consumption

Iodine deficiency disorder can be eliminated by the daily consumption of iodised salt which is both a preventive and corrective measure for iodine deficiency and the most effective, low-cost, long-term solution to a major public health problem. The daily requirement of iodine for adults is 150 micrograms.

Your responsibility in control of IDD is to check twice a year if families in your community are consuming iodised salt. You read how to conduct testing of the salt that families consume in Study Session 4.

Supplementation of iodine capsules to populations in areas where iodine deficiency in very common

As a short-term strategy in highly endemic areas, iodised oil capsules should be distributed on a one-time basis to individuals. This will cover the recipients for one to two years until salt iodisation processes are in place.

Iodine capsule dosages are:

One capsule for pregnant women and children under five.

Two capsules for women of reproductive age and children five to 14 years of age.

7.5.3 Strategies for the control of iron deficiency anaemia

The strategy for the reduction of iron deficiency anaemia should be holistic and sustainable. For this to happen there is a need to involve relevant stakeholders from agriculture, education, information and other relevant

sectors in planning and implementation of priority programs. The main strategies are the following:

Supplementation of iron and folic acid for pregnant and lactating women

Pregnant women require a much higher amount of iron than is met by most diets and therefore it is important that they routinely receive iron supplements. In places where anaemia is high, supplementation should continue into the postpartum period to enable them to acquire adequate stores of iron. Table 7.5 sets out the correct dosage and duration for iron and folic acid for pregnant and lactating women.

Table 7.5 Iron and folic acid doses for pregnant and lactating women.

Iron-folic acid doses	**Duration**
Iron: 60 mg/day Folic acid: 400 mcg/day	• Six months during pregnancy where anaemia prevalence is less than 40% • Six months during pregnancy and three months postpartum where anaemia prevalence is equal to or more than 40% • If it is not possible for women to take iron and folic acid for six months in pregnancy, supplementation should continue into the postpartum period or the dose should be increased to 102 mg/day

Supplementation for children and adolescents

Many children from six to 24 months of age need more iron than is available in breastmilk and common complementary foods. Infants with low birth weight have fewer iron stores, and are thus at a higher risk for deficiency after two months of age. In areas where iron fortified complementary foods are not available for regular consumption, children should routinely receive supplements in the first year of life. In areas where anaemia prevalence in young children is 40% or more, delivery of iron supplements should continue through the second year of life, and also be given to adolescent girls. Look at Table 7.6, which sets out the correct doses of iron and folic acid according to the age of the child.

Table 7.6 Iron and folic acid doses for universal supplementation for children and adolescents. (Source: WHO/UNICEF/UNU, 2001, Stoltzfus and Dreyfuss, 1998)

Group	Iron-folic acid doses	Duration
Low-birth weight infants (under 2500 g)	Iron: 2 mg/kg body weight/day Folic acid: 50 mcg/ day	two–24 months of age
6–24 month old children	Iron: 2 mg/kg body weight/day Folic acid: 50 mcg/ day	• six–12 months of age where anaemia prevalence is less than 40% • six–24 months of age where anaemia prevalence is equal to or more than 40%
24–59 month old children	Iron: 20–30 mg iron	At least once a week for three months
School-age children (6–11 years)	Iron: 30–60 mg/day	At least once a week for three months
Adolescents	Iron: 60 mg/day Folic acid: 400 mcg/ day	At least once a week for three months

Generally there are no side effects to supplementation if protocols are followed.

■ When might you deliver iron supplementation for children and adolescents?

□ There are a number of points in a child's or adolescent's development when you can encourage the mother, or the older child, to ensure that children and adolescents take iron supplements. For example early on, during postnatal care and the well baby visits, you can talk to the mother about this. You can also talk to the mother about iron supplements during a sick child visit. Other opportunities include school health programmes that you might advise on, or when you are providing family planning services and doing home visits.

Treatment of severe anaemia

If anaemia is diagnosed by clinical examination (extreme pallor of the palms of the hands) or by laboratory tests at health centre, treatment is as set out in the table below.

Children with severe acute malnutrition should be assumed to be severely anaemic. Oral iron supplementation should be delayed until the child starts eating again and gains weight, usually after 14 days.

Table 7.7 Iron and folic acid doses for treating severe anaemia in vulnerable groups. (Source: Stoltzfus and Dreyfuss, 1998)

Group	Iron-folic acid dose	Duration
Children under two years old	Iron: 25 mg/day Folic acid: 100–400 mcg/day	Three months
Children two–12 years old	Iron: 60 mg/day Folic acid: 400 mcg/day	Three months
Adolescents and adults, including pregnant women	Iron: 120 mg/day Folic acid: 400 mcg/day	Three months

Dietary diversification

Food diversification is an important strategy for prevention of iron deficiency. Populations should be encouraged to produce and consume iron-rich foods throughout the country at all times. Health Extension Practitioners can play a significant role in promoting the introduction of iron-rich foods and improving consumption and storage of such foods. As you know by now, the best source of iron for infants is breastmilk. Look at Table 7.8 overleaf. It describes the best animal and plant sources of iron. As you can read, the way food is processed and cooked has an impact on how well iron is absorbed.

Table 7.8 Examples of food sources rich in iron.

Animal sources of iron	Plant sources of iron
Animal products (meat, organs and blood) provide the best food sources of dietary iron. If these are available, children six to 24 months of age and pregnant women should have priority to include small amounts in their diet. Animal products provide iron that is absorbed easily. Animal products are also the only source of vitamin B12, an important micronutrient for preventing anaemia.	The best plant sources of iron include dark green leafy vegetables and legumes. Legumes are also excellent sources of folic acid. Consumption of foods which are rich in vitamin A will also prevent anaemia. Food processing techniques such as cooking, germinating, fermenting and soaking of grains should be encouraged as they reduce factors that inhibit iron absorption.

Control of malaria and worms

To control non-iron deficiency anaemia it is also critical to coordinate action with the malaria control and worms control programmes. Pregnant and lactating women and children should sleep under insecticide-treated bed nets.

Children between one and five years of age should receive de-worming drugs. The correct dosage is set out in Table 7.9

Table 7.9 Recommended drugs for de-worming pre-school children (one to five years).

Drugs	Dose for each age group			Comments
	0–1 year	1–2 years	2–5 years	
Albendazole	No treatment	½ tablet	1 tablet	These two are particularly attractive because they are single dose and there is no need to weigh the children
Mebendazole 500 mg tablet	No treatment	1 tablet	1 tablet	

- De-worming drugs are extremely safe and have no significant side effects
- Minor side effects like nausea and abdominal discomfort are rare usually well tolerated by the children
- Children under one year old are not treated, as they are not exposed to infection
- Accidental repeated treatment with several doses of de-worming drugs is not dangerous.

No special training is needed to administer de-worming drugs. Non-health workers with minimal training can easily and safely give them. Training someone on how to administer the drugs and the benefits of de-worming can be done in a few hours. In addition, it is important to encourage hygiene and environmental sanitation to prevent women, children, or people living with HIV and AIDS from getting parasites such as worms.

7.6 Prevention and control of vitamin A and iodine deficiencies

In addition to the supplementation and treatment services you have just read about, there are other equally important activities that you can do within your community to address micronutrient deficiencies.

To address vitamin A deficiency you can:

- Help to mobilise and support communities to produce fruit and vegetable gardens to improve access to vitamin A rich foods
- Support community child health days
- Ensure an adequate supply of vitamin A capsules for your community
- Monitor vitamin A supplementation coverage in your community.

To address iodine deficiency disorder you can:

- Help to strengthen the national iodine deficiency control and prevention programme by monitoring use of iodised salt in your community twice a year (Study Session 5)
- Implementing advocacy and creating demand for universal consumption of iodised salt.

7.7 Prevention and control of zinc deficiency

Zinc is an essential nutrient for human health. It is a key factor for normal growth and in the fight against child illness and mortality in developing countries and therefore very important for public health. In addition, when zinc is provided as a supplement to children in lower-income countries, it reduces the frequency and severity of diarrhoea, pneumonia and possibly malaria. There is also some evidence that zinc supplementation of women during pregnancy may prevent adverse outcomes of pregnancy and contribute to increased infant weight gain and a reduced risk of infection.

Zinc supplements have been shown to increase the growth and weight gain of stunted or underweight children. Moreover, studies have shown that children who receive zinc supplements have lower death rates.

Approximately one third of the world's population live in areas at high risk of zinc deficiency. The most vulnerable population groups are infants, young children, and pregnant and lactating women because of their additional requirements for this essential nutrient.

7.7.1 Zinc deficiency and the Millennium Development Goals

Zinc intervention programmes can help to achieve three of the four health-related MDGs:

- MDG 4: Reduce child mortality — zinc deficiency contributes substantially to diarrhoea and pneumonia, which are the most common causes of death among children in developing countries. Therefore, interventions to enhance the zinc intake of children in low-income countries are a useful strategy to reducing child mortality rates
- MDG 5: Reduce maternal mortality — zinc deficiency can result in protracted labour, which increases maternal mortality rates and adversely affects the fetus. Therefore, improving the zinc intake of women before and during pregnancy may help to reduce maternal mortality and benefit infant growth and survival
- MDG 6: Combat HIV/AIDS, malaria, and other diseases — there is evidence that zinc supplementation may reduce the severity of malaria. In addition, zinc supplementation reduces the risk of both diarrhoea and pneumonia, which frequently complicate HIV infections. Therefore, zinc supplementation may reduce fatalities from these diseases.

7.7.2 Addressing zinc deficiency

Exclusive breastfeeding during the first six months of life should be supported because breastmilk is an excellent source of zinc. For young children, complementary feeding practices should be implemented with zinc-rich foods, such as animal source foods, and zinc-fortified complementary foods. The table below shows food sources with different levels of zinc content.

Table 7.10 Food sources of zinc.

Zinc content	Types of food
Foods that provide the highest concentrations of zinc	Lean red meat, whole-grain cereals, pulses and legumes
Food sources with moderate zinc content	Processed cereals with low extraction rates, polished rice, and chicken, pork or meat with high fat content
Foods with small amount of zinc	Fish, roots and tubers, green leafy vegetables and fruits are only modest sources of zinc
Foods with very low zinc content	Saturated fats and oils, sugar, and alcohol

Opportunities to improve zinc status should be considered in the context of ongoing general health and nutrition programme such as growth monitoring programmes, diarrhoea treatment facilities, integrated management of childhood illnesses (IMCI) interventions and national fortification programmes.

Summary of Study Session 7

In Study Session 7 you have learned that:

1 If the vitamin A status in the body is very low, the immune system becomes weak and illness is more common and more severe, increasing under-five death rates.

2 Lack of vitamin A can lead to eye damage or, when severe, can cause blindness.

3 There is an increased risk of a woman dying during pregnancy and the first three months after delivery, if her vitamin A status is low.

4 Babies born to mothers with iodine deficiency are at risk of suffering from some degree of learning disability.

5 Iron deficiency reduces learning capacity especially in preschool age children. In adults, anaemia reduces work capacity and mental performance as well as tolerance to infections. Iron deficiency anaemia can also cause increased maternal mortality due to bleeding problems.

6 Zinc is required for normal child growth. In addition, zinc reduces the frequency and severity of diarrhoea, pneumonia, and possibly malaria.

7 There are several strategies that can be used to treat and control anaemia and vitamin A, iodine and zinc deficiencies, including promoting diverse diets and providing supplements at critical times such as during early childhood and pregnancy.

Self-Assessment Questions (SAQs) for Study Session 7

Now that you have completed this study session, you can assess how well you have achieved its Learning Outcomes by answering the questions below. Write your answers in your Study Diary and discuss them with your Tutor at the next Study Support Meeting. You can check your answers with the Notes on the Self-Assessment Questions at the end of this Module.

SAQ 7.1 (tests Learning Outcomes 7.1 and 7.2)

How does vitamin A deficiency impact on the health of children in Ethiopia?

SAQ 7.2 (tests Learning Outcome 7.3)

Who are the individuals most vulnerable to vitamin A deficiency, iodine deficiency disorder and iron deficiency anaemia in your community?

SAQ 7.3 (tests Learning Outcomes 7.4, 7.5 and 7.6)

What are the consequences of iodine deficiency disorder and iron deficiency anaemia for children and women in Ethiopia?

SAQ 7.4 (tests Learning Outcome 7.7)

Imagine you have identified people in your community who are suffering from vitamin A deficiency, iodine deficiency disorder and iron deficiency anaemia. What can you do to address these problems?

Study Session 8 Household Food Security

Introduction

In the previous study session you learned about the micronutrient deficiencies that are of greatest public health importance in Ethiopia. In this session you will be introduced to the issue of the overall shortage of food at the household level (**household food insecurity**). You will learn about its causes, consequences and prevention as well as nutrition emergency interventions. Coping strategies that may be adopted by households in response to constrained food supplies will be described, using local examples.

Learning Outcomes for Study Session 8

When you have studied this session, you should be able to:

8.1 Define and use correctly all of the key words in **bold**. (SAQs 8.1 and 8.2)

8.2 Define household food security. (SAQs 8.1 and 8.2)

8.3 Describe the causes of household food insecurity. (SAQs 8.1, 8.2 and 8.3)

8.4 Describe various stages of coping strategies of food insecurity. (SAQ 8.4)

8.5 Describe food security situations in Ethiopia. (SAQs 8.3 and 8.5)

8.6 Explain some of the food security strategies of Ethiopia. (SAQs 8.4 and 8.6)

8.7 List methods of preventing food insecurity. (SAQs 8.4 and 8.6)

8.8 Identify nutrition interventions during a nutrition emergency. (SAQs 8.5, 8.6 and 8.7)

8.9 Describe the consequences of household food insecurity. (SAQs 8.5 and 8.6)

8.1 Household food security

Household food security exists when all the people living in the household have physical, social and economic access to sufficient, safe and nutritious food at all times that meets their dietary needs and food preferences for an active and healthy life (World Food Summit Declaration, 1996). This definition is based on three core concepts of food security:

- Availability (physical supply of food)
- Access (the ability to acquire food)
- Utilisation (the capacity to transform food into the desired nutritional outcome).

If these conditions are not fulfilled then the household is said to be in the state of **food insecurity**.

8.2 Chronic and acute food insecurity

In your own community you might have become aware of households with food insecurity. There are two forms of food insecurity; chronic and acute. **Chronic food insecurity** is commonly described as the result of

overwhelming poverty indicated by a **lack of assets** (means of living). **Acute food insecurity** is usually considered to be more of a short-term phenomenon related either to manmade or unusual natural shocks, such as drought. While the chronically food insecure population may experience food deficits relative to need in any given year, irrespective of the impact of shocks, the acutely food insecure require short term assistance to help them cope with unusual circumstances that impact temporarily on their lives and livelihoods. Both chronic and acute problems of food insecurity are widespread and severe in Ethiopia.

Table 8.1 depicts the types of households that are vulnerable to chronic and acute food insecurity in rural and urban settings within Ethiopia.

Table 8.1. Households that are vulnerable to acute and chronic food insecurity.

	Rural	**Urban**	**Others**
Chronic	Resource poor households Landless or land-scarce households Poor pastoralists Female-headed households Elderly, disabled and sick Poor non-agricultural households Newly established settlers	Low income households employed in informal sector Those outside the labour market Elderly, disabled and sick Some female-headed households Street children	Refugees Displaced people
Acute	Resource poor households vulnerable to shocks, especially drought Farmers and others in drought prone areas Pastoralists Others vulnerable to economic shocks (eg. in low potential areas)	Urban poor vulnerable to economic shocks, especially those causing food price rises	Groups affected by temporary civil unrest

- What segments of the population are vulnerable to chronic food insecurity?

□ You may have thought of a number of people who are particularly vulnerable to chronic food insecurity, such as those who are not in work, the elderly, sick and disabled, female-headed households, and street children. People living in low income households, with informal employment are also very vulnerable.

8.3 Causes of household food insecurity

If you think of food insecurity within your own community you might have become aware of a number of different causes. In Ethiopia natural and man-made disasters are the commonest causes of household food insecurity.

Drought and conflict are the main factors that increase problems of food production, distribution and access. High rates of population growth and poverty also play a part, within an already difficult environment of fragile ecosystems where it might be difficult to produce sufficient food. The fact that almost 80% of the population in Ethiopia depends almost exclusively on agriculture for its consumption and income needs means that measures to address the problems of poverty and food insecurity must mainly be found within the agricultural sector.

Other natural disasters such as pest infestations destroy area-specific production levels and the threat of locust swarms is often present. Currently there is an ineffective weather and pest early warning system in the country.

Depending only on rainwater for farming when there is variable rainfall in some of the arid areas is not reliable for producing sufficient food supply. Initiatives in Ethiopia, such as using irrigation systems, water harvest technology and drip irrigation, are encouraging steps that need to be strengthened further. Figures 8.1 and 8.2 illustrate the importance of adequate drinking water and grazing land for farming animals. Table 8.2 overleaf summarises the different causes of household insecurity.

Figure 8.1 Animals need an adequate source of drinking water. (Photo: Dr Basiro Davey)

Figure 8.2 Animals need adequate grazing land. (Photo: Dr Basiro Davey)

Table 8.2 Causes of food insecurity.

Causes of food insecurity	**Mechanism (how it leads to food insecurity)**
Rapid population growth	A high rate of population growth calls for more food production and the need for ploughing more land. This leads to deforestation. Population may exceed the carrying capacity of the fragile environment in some areas At the household level the food produced from the same plot of land that the household has may not be sufficient. It is also very difficult to purchase food for large numbers of family members
Conflict/civil war/ trans-border war	Interferes with production, marketing and distribution Shunts the gross domestic product (GDP) towards purchase of war weapons
Extreme production fluctuation	Decreases food supplies available for consumption
Limited employment other than farming	Leads to poor purchasing power of households
Lower level of saving	Leads to poor purchasing power of households
High rate of natural erosion	Poor soil fertility and decreased productivity leading to food supply shortages
High rate of illiteracy and school attendance	Poor income earning power and hence purchasing power due unemployment
Poor health and sanitation	Morbidity, mortality and reduced productivity due to illness
Deforestation	Leads to high top soil erosion and poor soil fertility. It will lead to decreased rainfall and dryness

HIV/AIDS	HIV/AIDS leads to 'green famine' which has far-reaching adverse implications. There are four ways in which HIV/AIDS is linked to famine: • Changes in dependency patterns (children are dependent on children OR on the elderly due to death or frequent sickness of an adult) • Loss of assets and skills associated with adult mortality • The burden of care for sick adults and orphaned children • The vicious interaction between malnutrition and HIV infection
Poor governance	Corruption and diversion of public resources to personal use Poor distribution of resources
High rates of chronic malnutrition	Decreased wellbeing leading to decreased intellectual and physical productivity of people
Natural resource constraints	The limitations of rainfall in the country place certain constraints on improving food security. The chances of drought occurring in parts of Ethiopia have increased the probability of food insecurity, especially in the arid and pastoralist areas (northern and eastern parts of Ethiopia)
Traditional rain-dependent farming systems	Lack of agricultural intensification and low agricultural productivity means that many of those in rural areas remain subsistence producers. Therefore, the large quantity of food at low prices which is essential for economic growth in urban areas is not available

Stop reading for a while and think of the causes of food insecurity in your area. Are any of the above causes common in your community?

8.4 Indicators of household food insecurity

Food insecurity can be measured using two direct indicators:

- Use of coping strategies
- Dietary diversity score.

Indirect indicators can also give clues to the presence of household food insecurity. These include measuring the percentage of children under five years old who are malnourished and other early warning signs of vulnerability such as low rainfall or the presence of other disasters.

8.4.1 Use of coping strategies as indictors of food insecurity

Food insecurity is a matter of global concern, although it is most frequently observed in Sub-Saharan Africa. One of the most common methods for identifying food-insecure households or regions is to look at the frequency and types of coping strategies.

Coping strategies are social responses used to offset threats to a household's food and economic resources in times of hardship. The different types of coping strategies are markers of the severity of conditions, often categorised into four distinct stages of food insecurity.

Stage 1: Insurance strategies

The first stage of household food insecurity is marked by the initial shortage of food, or inability to provide sufficient quantities of food to all members of the household.

Households may have prepared for a food quantity shortfall, as in the case of seasonal production, by storing quantities of grain or owning livestock that can be quickly sold, traded, or used for food (in the case of agricultural societies). These are often referred to as insurance (**reserve food crisis**), and are not intended to be a main source of income or an integral part of income generation, simply crisis insurance. But, before any assets are sold, changes in diet and frequency of meals per day are the first adaptations undertaken. Rationing of food consumption is a very common response, and is started and planned generally far in advance of selling any assets. The frequency and severity of coping strategies practiced will vary according to the causes of the food shortage (chronic vs. crisis), kinds of households affected (agricultural vs. pastoral), local market conditions, and the absence or presence of relief programmes.

Box 8.1 sets out the most common stage 1 food security indicators.

Box 8.1 Stage 1 food insecurity indicators

- Diet change (consuming less preferred foods such as corn instead of rice)
- Meal frequency (decreasing the number of meals per day)
- Gathering wild foods
- Inter-household transfers and loans
- Increased petty commodity production (firewood, charcoal, etc.)
- Seeking daily labour
- Diversifying activities and working for long hours.

Stage 2: Crisis strategies I

The second stage of food insecurity is marked by the sale of assets, specifically non-productive assets.

At this point, in the food security crisis, food consumption becomes more important than holding onto assets. Jewellery, goats, chickens, other livestock and any other asset that serves as crisis insurance would be sold. Generally, the assets that are preserved are those related to income generation, such as land, farming equipment, oxen and cattle. In addition to non-productive asset sales, the second stage also sees the onset of loans or credit from merchants (as opposed to family), which also has serious implications for the future security of the household and recovery to their original livelihood systems. Typical second stage indicators include those set out in Box 8.2 overleaf.

Box 8.2 Stage 2 food insecurity indicators

- Sales of non-productive livestock
- Sales of jewellery, insurance assets
- Credit or loans from merchants
- Temporary migration for work or land (days/week, days/month)
- Skipping meals for entire days
- Withdrawing children from school (school drop out).

Stage 3: Crisis strategies II

Stage 3 includes the sale of productive assets and the shift of the number one priority from asset preservation to food consumption.

At this point, all else has either failed to provide sufficient food quantities or the crisis has prolonged itself into a dire situation. All livestock remaining at this juncture will be sold, all personal items sold, possibly even the sale of housing material, and the pledging and/or sale of land or productive rights. This disposal of all assets ensures current survival, but severely jeopardises the future security (livelihood system) of the household. In the case of natural disasters, such as drought, many assets will be lost involuntarily, specifically livestock succumbing to disease or starvation. When the crisis has reached this stage, famine conditions have essentially set in. Indicators of stage three might include those set out in Box 8.3.

Box 8.3 Stage 3 food insecurity indicators

- Sale of all livestock
- Sale of productive equipment
- Sale or mortgage of land
- Redistribution of children (rare)
- Migration.

Stop reading for a while and think of some of the coping strategies that are used in your community or in another community you know when food insecurity occurs.

Stage 4: Distress strategies

Stage 4 is the last in the line and represents complete destitution.

The household no longer exists as it once did. Permanent migration (either the whole or part of the household) occurs in order to attempt to resettle on suitable land, find wage labour or, more likely, to seek food aid assistance. Individuals are generally too weak to work and simply need food and care to survive. Box 8.4 overleaf highlights indicators of stage 4.

Box 8.4 Stage 4 food insecurity indicators

- Permanent migration
- Begging for food/resources
- Complete dependence on external aid.

There is a spectrum of situations that may precipitate crises, possibly ranging from normal, seasonally linked low or zero production, to consecutive years of poor production, to natural disasters and armed conflict. Coping strategies need to be seen in context, and in complex emergencies the situation is different from those situations relating to consecutive seasons of crop failure or seasonal dips in the amount of stored food or resources to obtain food. For example, people suffering due to poor agricultural production might slowly move from stage 1 to stage 2 or 3, whereas in acute emergencies, people might be 'shocked' directly into strategies of state 3 or 4, due to sudden external forces such as a flood or armed conflict.

8.4.2 Dietary diversity score

Dietary diversity (DD) has long been recognised as a key element of food security. It is usually measured by summing up the number of foods or food groups consumed over a period of time. Consumption of a more diversified diet is an indicator that the household is food secure; while a less diversified diet is an indicator of food insecurity. You looked at how to measure dietary diversity in Study Session 5 of this Module.

■ What is the relationship between food insecurity and dietary diversity?

□ Food insecurity leads to consumption of less diversified diet and therefore, a lack of dietary diversity is a measure of food insecurity.

8.4.3 Consequences of household food insecurity

Many countries, including Ethiopia, experience perpetual food shortages and distribution problems leading to chronic and often widespread hunger amongst significant numbers of people.

The body's response to chronic hunger and malnutrition is a decrease in body size. As you will recall from an earlier study session, in small children this is known as **stunting**, or stunted growth, and is indicated by low weight for height. This process starts as the baby is growing in the uterus, if the mother is malnourished, and continues until approximately the third year of life. It leads to higher infant and child mortality, with rates increasing significantly during famines. Once stunting has occurred, improved nutritional intake later in life cannot reverse the damage. Stunting itself is viewed as a coping mechanism, designed to bring body size into alignment with the calories available during adulthood in the location where the child is born.

Limiting body size as a way of adapting to low levels of energy (calories) adversely affects health in many ways:

- Premature failure of vital organs occurs during adulthood. For example, a 50-year-old individual might die of heart problems because their heart suffered structural defects during early development

- Stunted individuals suffer a far higher rate of disease and illness than those who have not undergone stunting
- Severe malnutrition in early childhood often leads to defects in mental development
- Chronic food insecurity will lead to poor growth, slower development, low educability, school absenteeism or dropout, and increased morbidity and decreased survival impacting on the socioeconomic development through several generations.

■ Can stunting that occurred due to food insecurity during the earlier periods of life be reversed at a later age?

□ Once stunting has occurred, improved nutritional intake later in life cannot reverse the damage. Stunting itself is viewed as a coping mechanism, designed to bring body size into alignment with the calories available during adulthood in the location where the child is born.

■ What are the ways in which food insecurity impacts on a person's development?

□ Food insecurity decreases adequate and balanced food consumption, leading to poor physical growth and mental development. It also increases vulnerability to morbidity and mortality. Food insecure people are less productive both physically and intellectually.

8.5 Food insecurity situations in Ethiopia

Ethiopia has been renowned as a country of famine and food insecurity for many years. Drought impacts on the ability of livestock to survive (see Figure 8.3), but food insecurity has grown worse in recent years for several reasons. This includes increased land degradation due to increased population pressure.

Figure 8.3 Drought can affect animals extremely. (Photo: Dr Basiro Davey)

When we look at the distribution of food insecurity in Ethiopia, the majority of people living in the northern and eastern part of the country are living in arid regions that are prone to food insecurity.

8.6 Ethiopian food security strategy

Ethiopia's food security strategy highlights the government's plans to address the causes and effects of food insecurity in Ethiopia. The food security strategy has two major approaches towards achieving food security in Ethiopia:

1 Enhancing agricultural productivity

2 Asset building/productive safety net programmes (PSNP).

PSNP aim to build the assets of the poorest of the poor to enable them to develop means of living (livelihood).

Therefore, the food security strategy places a significant focus on the following issues:

- **Environmental rehabilitation**: Measures to reverse the level of land degradation and create a source of income generation for food-insecure households through a focus on biological measures, such as re-forestation and land preservation.
- **Water projects**: Water harvesting and the introduction of high-value crops, livestock and agro-forestry development.
- **Enhancing agricultural productivity:** Agriculture is considered to be the starting point for initiating the structural transformation of the economy. Because of this, agricultural development-led industrialisation (ADLI) has been pursued as a major policy framework since 1991. ADLI assists the development of agriculture and helps expand markets for domestic production leading to increased incomes for small holders.
- **Controlling population growth**: High population growth rates continue to undermine Ethiopia's ability to be food secure and provide effective education, health and other essential social and economic services. The central elements of the policy focus on a multi-sector approach, improving family planning services and expanding education.
- **Prevention and control of HIV/AIDS**: HIV/AIDS is a formidable challenge to the pursuit of food security in Ethiopia as it reduces and debilitates the productive population and society as a whole. The government has put in place a national policy and countrywide programme for the whole population to control and reduce the spread of the disease.
- **Gender**: Women have a substantive productive role in the rural sector, including participation in livestock maintenance and management, crop production, and the marketing of rural produce. Integration of gender perspectives in the design and implementation of economic and social policies, programmes and projects is considered central to the national food security strategy.
- **Environmental sustainability**: This is critical to the pursuit of food security and economic development generally. Development depends on the appropriate and sustainable use of the environment and the management of natural resources. Given the high environmental degradation in drought-prone and pastoral areas, environmental rehabilitation (soil and water conservation) is an essential element.

- What are the approaches of the National Food Security Strategy and why are they important?

- The two major approaches for achieving food security in Ethiopia are: enhancing agricultural productivity and asset building/PSNP. They are important approaches which aim to tackle the causes of food insecurity and the serious problems created by these for social wellbeing and economic growth in Ethiopia.

8.7 Nutrition emergency interventions

Nutrition emergency interventions are set up to prevent the death of many people in the community and to protect their livelihood systems. The interventions are aimed at reducing excess mortality that might result during the first few weeks to months of the emergency situation. The emergency interventions might involve provision of:

- Food
- Shelter (if people are already displaced)
- A programme to control diarrhoeal diseases and follow up (surveillance) of epidemic occurrence
- A curative care unit
- Coordination of operational partners, including the sector offices and non-governmental organisations working in your community.

Responses include those that are curative, such as therapeutic care and those that are preventative of further problems such as improving the water supply and sanitation to prevent epidemics of disease.

Two main interventions to protect livelihood and prevent deaths are:

1 General food distribution (GFD)

2 Selective feeding programmes, such as:
   - Supplementary feeding programmes (SFP)
   - Blanket supplementary feeding programmes (BSFP)
   - Therapeutic feeding programmes (TFP).

8.7.1 General food distribution

The aim of general food distribution (GFD) is to cover the immediate basic food needs of a population in order to eliminate the need for survival strategies which may result in long-term negative consequences to human dignity, household viability, livelihood security and the environment. Ideally a standard general ration of food is provided in order to satisfy the full nutritional needs of the affected population.

In a population affected by an emergency, the general ration should be calculated in such a manner as to meet the population's minimum energy, protein, fat and micronutrient requirements for light physical activity. There are two ways of distributing a general ration:

1 Employment generation schemes (EGS); a conditional transfer of rations that requires public work for a person to qualify for the ration

2 Gratuitous relief (GR)/general food distribution (GFD); an unconditional (free) distribution scheme.

Due to the fact that food aid dependency is a major concern in Ethiopia, 80% of the food aid is distributed through EGS, especially in areas that are chronically food insecure. Healthcare systems and water resources may also require support. In a famine the primary goals are to ensure survival and reduce mortality.

8.7.2 Selective feeding programmes

There are two approaches to the actual distribution of food: targeted and blanket. Within these two approaches there are two kinds of programmes: supplementary feeding programmes (which may be 'targeted' or 'blanket') and therapeutic feeding programmes.

Targeted supplementary feeding programmes

In this approach supplementary food is restricted to those individuals identified as the most malnourished, or most nutritionally vulnerable or at risk during nutritional emergencies. This includes pregnant women, lactating mothers and young children under five years of age (see Figure 8.4). The main objective of a targeted supplementary feeding programme is to prevent the moderately malnourished from becoming severely malnourished and consequently, to reduce the prevalence of severe acute malnutrition and associated mortality.

Figure 8.4 Children and women form an early morning queue to await a food distribution at a supplementary feeding centre in Gode, Ethiopia. (Photo: UNICEF Ethiopia)

Blanket supplementary feeding programme

In blanket supplementary feeding programmes (SFP) food is distributed as a temporary measure to all vulnerable members of a population at risk of becoming malnourished without identifying the most malnourished. The general objective of a blanket SFP is to prevent widespread malnutrition and mortality.

Therapeutic feeding programme

Therapeutic feeding programmes (TFPs) provide a rehabilitative diet together with medical treatment for diseases and complications associated with the presence of severe acute malnutrition.

The specific aim of TFPs is to reduce mortality among acutely severely malnourished individuals and to restore health through rehabilitating them. TFPs may be administered through the following venues:

- Therapeutic feeding centre (TFC)
- Nutrition rehabilitation unit (NRU) at a hospital or health facility
- Community-based therapeutic care (CTC/OTP) programme.

Figure 8.5 shows a five-year-old Khesna, who is severely malnourished, drinking therapeutic milk at the UNICEF-supported feeding unit of Bissidimo Hospital in East Harerghe Zone of Oromia Region. The milk is rich in micronutrients and is the first phase of a feeding regimen—eight times daily—that helps the body recover from the shock of malnutrition and conditions it to digest food. Khesna must initially be fed small portions, slowly.

■ What is the objective of blanket supplementary feeding?

□ It is temporary measure for all vulnerable members of a population at risk of becoming malnourished, without identifying the most malnourished, to prevent widespread malnutrition and mortality.

Figure 8.5 Severely malnourished child drinking therapeutic milk. (Photo: UNICEF Ethiopia)

In conclusion, food insecurity obliges households to use coping strategies that can, over time, lead to poor health consequences especially for vulnerable segments of the population. As a Health Extension Practitioner, household food insecurity is one of the major issues you should address, working closely with other stakeholders in your community.

Summary of Study Session 8

In Study Session 8 you have learned that:

1 Household food insecurity is where no-one in the household has physical, social and economic access to sufficient, safe and nutritious food that meets dietary needs and food preferences for an active and healthy life at all times

2 Chronic food insecurity is commonly perceived as a result of overwhelming poverty indicated by a lack of assets, while acute food insecurity is viewed as more of a transitory phenomenon related to man-made or unusual shocks, such as drought

3 The major causes of food insecurity are man-made and natural disasters, rapid population growth, and increased land degradation interfering with food productivity, marketing and distribution

4 Indicators for household food insecurity include coping strategies, based on the stage of food insecurity, and a low dietary diversity score

5 Ethiopia's food security strategies focus on mechanisms of enhancing productivity and asset building programmes like productive safety nets programmes

6 Different emergency nutrition interventions may be set up if the need arises. These include: blanket supplementary feeding, targeted supplementary feeding and general ration distribution.

Self Assessment Questions (SAQs) for Study Session 8

Now that you have completed the study session, you can assess how well you have achieved its Learning Outcomes by answering these questions. Write your answers on your study diary and discuss them with your Tutor at the next Study Support meeting. You can check your answers with the Notes on the Self Assessment Questions at the end of the Module.

SAQ 8.1 (tests Learning Outcomes 8.1, 8.2 and 8.3)

Why might household food insecurity exist even when there is enough food available?

SAQ 8.2 (tests Learning Outcomes 8.1, 8.2 and 8.3)

(a) Who are the people in your community who are most vulnerable to *chronic* food insecurity?

(b) What other groups in your community are vulnerable to *acute* food insecurity?

SAQ 8.3 (tests Learning Outcomes 8.3 and 8.5)

Identify three possible causes of food insecurity in your community.

SAQ 8.4 (tests Learning Outcomes 8.4, 8.6 and 8.7)

If people start to leave an area each day to look for work, what stage of the coping strategy is this?

SAQ 8.5 (tests Learning Outcomes 8.5, 8.8 and 8.9)

(a) Why is food insecurity such an important issue for Ethiopia?

(b) Is your community in an area that is likely to have food insecurity? Give reasons for your answer.

SAQ 8.6 (tests Learning Outcomes 8.6, 8.7, 8.8 and 8.9)

What role do women have to play in Ethiopia's Food Security Strategy?

SAQ 8.7 (tests Learning Outcome 8.8)

Imagine you are a Health Extension Practitioner living in a community where there has been a severe drought for three years.

(a) Describe who are likely to be the most vulnerable people in that community and why.

(b) What strategies might be used to support these vulnerable people?

Study Session 9 Managing Acute Malnutrition

Introduction

While monitoring the growth of children and promoting good feeding, caring and health seeking behaviours, you may find children who need intervention because of acute malnutrition.

You need to know how to identify acute malnutrition and how to differentiate between severe acute malnutrition, and moderate acute malnutrition. In this session, you will apply your knowledge of nutritional assessment to decide whether children are acutely malnourished or not. The study session will teach you how to make further use of anthropometric measurements like MUAC (mid-upper arm circumference), oedema, weight and height which you learned about in Study Session 5. Finally, you will learn the principles of management of people with moderate acute malnutrition. You will look at the management of people with severe acute malnutrition in Study Session 10.

Learning Outcomes for Study Session 9

When you have studied this session, you should be able to:

9.1 Define and use correctly use all key words printed in **bold**. (SAQ 9.1)

9.2 Explain the use of anthropometric measurements for identification of acute malnutrition. (SAQ 9.2)

9.3 Explain how to interpret anthropometric measurements. (SAQ 9.2)

9.4 Describe how to care for children with moderate acute malnutrition (MAM). (SAQs 9.1 and 9.3)

9.5 List the components of, and be able to plan for, Enhanced Outreach Strategy/Child Health Days (EOS/CHD). (SAQ 9.4)

9.6 Explain the main features of service organisation for EOS/CHD. (SAQ 9.4)

9.1 Anthropometric criteria for defining severe and moderate acute malnutrition

Table 9.1 overleaf shows the criteria (indicators) you need to use to decide the level of acute malnutrition. When the nutritional status of a child deteriorates in a relatively short period of time, the child can be said to have acute malnutrition. As you saw in Study Session 5, weight-for-height, MUAC and oedema are used to decide if someone is acutely malnourished or not. Oedema in children almost always signifies the presence of severe acute malnutrition. However, when using MUAC and weight-for height you need to use ‘cut-offs’ in order to determine whether a child has moderate acute malnutrition, severe acute malnutrition or no acute malnutrition.

Table 9.1 Indicators to classify the level of acute malnutrition.

Indicator	Severe acute malnutrition	Moderate acute malnutrition	No acute malnutrition
Children (6 months up to 18 years)			
W/H (weight for height)	Less than 70% of norm	70–79.99%	More than 80%
Oedema (bilateral and pitting	Present	Absent	Absent
MUAC (cm)	Less than 11 cm	11–11.99 cm	More than 12 cm
Adults (older than 18 years)			
BMI	Less than 16	Between 16–16.99	18.5–24.99
Oedema	Present	Absent	Absent
MUAC (cm)	Less than 17 cm or Less than 18 with recent weight loss or chronic illness	17–21 cm or 18–21 cm depending on presence of recent weight loss or chronic illness	No weight loss

As indicated in the table, there are different indicators for **severe acute malnutrition** and **moderate acute malnutrition** depending on whether you are measuring an adult or a child. If you look in the column 'severe acute malnutrition' (SAM) you will see that if a child's weight/height measurement is less than 70% of the normal range for his age (which can also be written as <70%), then the child has an indicator of SAM. Another criterion is when the child's MUAC is less than 11 cm (written as <11 cm).

The presence of *one criterion* is sufficient to categorise a patient as malnourished. If there is any one indicator from the severe acute malnutrition column, then the child or adult is classified as severely malnourished. If there is no indicator in the severe column, and there is at least one indicator in the moderate acute malnutrition column, then the child or adult is classified as moderately malnourished. If **none** of the indicators are in the severe acute malnutrition or moderate acute malnutrition column, that means all the indicators are in the normal range and the child or adult is classified as 'no acute malnutrition'. You looked at how to measure oedema and MUAC in Study Session 5. Figure 9.1 overleaf reminds you how to do both of these measurements.

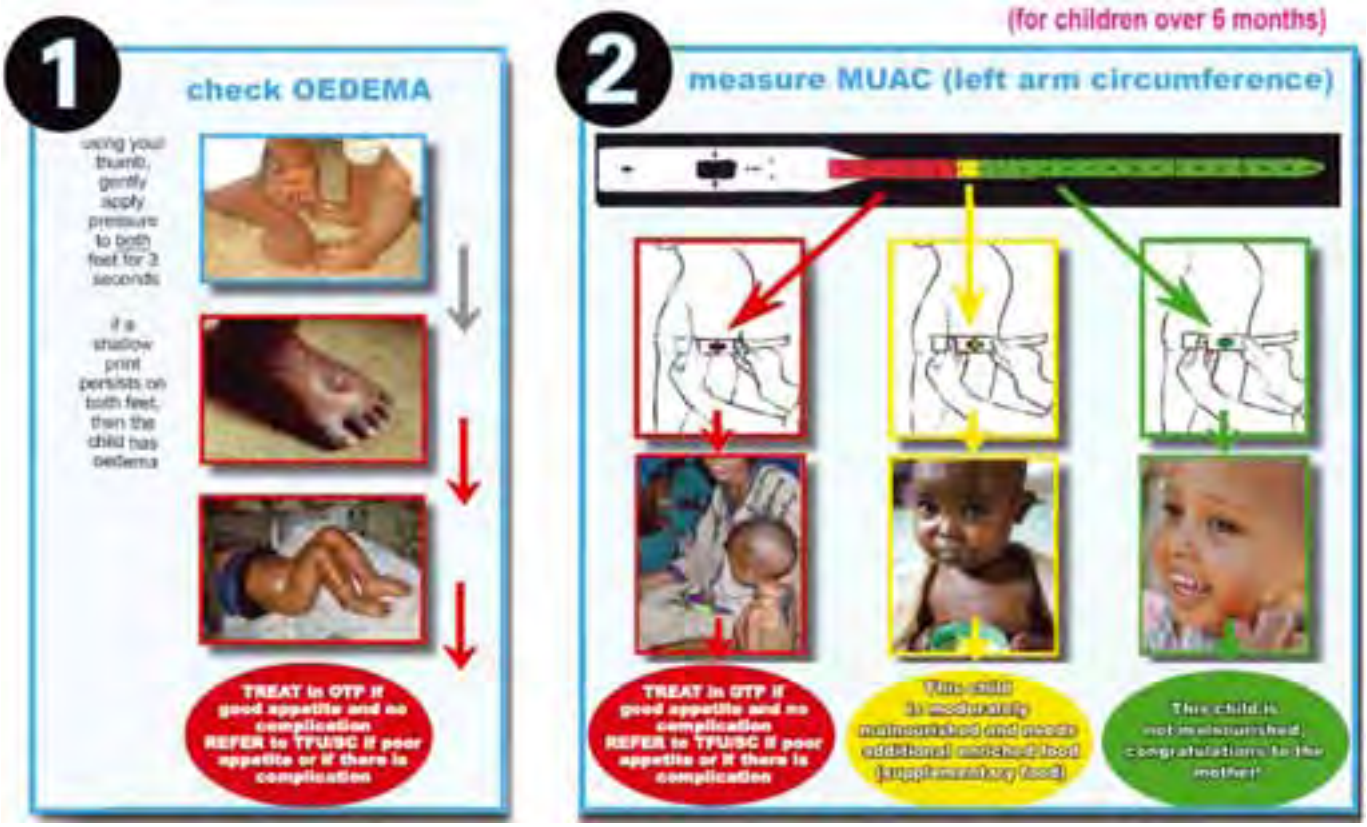


Figure 9.1 How to identify acute malnutrition in a child. (Source: Federal Ministry of Health / UNICEF, 2007, *EOS Poster*)

- What are the criteria used to classify someone as moderately malnourished?

- Your answer will depend on whether you are classifying a child or an adult. For example, a child is classified as moderately malnourished if their MUAC is 11–11.99 cm, or if the weight-for-height is in the range of 70–79.99% of the normal range. Children who have oedema are suffering from severe acute malnutrition. For women, having a MUAC of 17–22 cm or a BMI of 16–16.99 indicates moderate malnutrition. However, women with a MUAC between 17–18 cm should be classified as severely malnourished if they have had recent weight loss or chronic illness.

9.2 Principles of management of moderate acute malnutrition

Pregnant women, lactating mothers and children under five are particularly at risk as they have increased nutritional needs. Particular attention is given to these vulnerable groups when trying to address moderate acute malnutrition. The aim of intervention for moderate acute malnutrition (MAM) is to rehabilitate moderately malnourished children, to prevent further deterioration of nutritionally vulnerable groups, and to ensure adequate intake to support pregnancy and lactation.

When you are working with families you should always consider what they have available at home and how best the family can support the moderately malnourished woman or child, so that they can become fully rehabilitated. Keep local solutions as the first option as much as possible, since they are

Local solutions to malnourishment are more likely to have a sustainable impact.

more likely to be sustainable. Below are general guidelines to help you manage cases with moderate acute malnutrition.

9.2.1 Where there is no supplementary feeding programme

If the malnourished person is an adult or older child, you can discuss their condition with them. If it is a younger child who is malnourished, then you would talk with their caregiver. Involving the family in discussions helps them to think about why the adult or child may have become malnourished. Your knowledge on causes of malnutrition from Study Session 6 will help you here. You can then provide nutritional advice to the entire family to ensure that the moderately malnourished person takes energy-rich food, as well as more fat and protein in their diet. You can look again at the study session on essential nutrients and food sources if you need to remind yourself about energy-rich foods.

Following up the progress of the moderately malnourished person is very important to encourage continuation of good feeding and caring behaviour (you will learn how to do nutrition counselling in Study Session 11). Plan to do a home visit within one or two weeks of your first visit to see how the family is implementing your recommendations. The aim of your intervention is to move the moderately malnourished person back into the normal range in the table above.

- What can you do for a moderately malnourished child where there is no supplementary feeding?

- You may have rightly said that you will provide nutritional advice to the family, especially the primary caregiver and follow up the progress by doing a home visit to see if the family is following your recommendations and the child is improving.

9.2.2 Where there is a supplementary feeding programme

Targeted supplementary feeding

There may be a **targeted supplementary feeding** programme **(TSF)** in your *woreda*. You looked briefly at these in Study Session 8. TSF is a programme where regular (three or six monthly) nutritional screening is done in the community followed by provision of blended food either by the health workers or food distribution agents in collaboration with the *kebele* administration. It is usually organised in a service package of an Enhanced Outreach Strategy and Child Health Days (EOS/CHD). Details of EOS/CHD are discussed later in this study session.

Nutritional advice to families should remain a priority, even in *woredas* where there is a TSF. However, long-term food security problems may affect the availability of food at home and make it harder for the family to follow your recommendations. Therefore in addition to the nutritional advice you give, targeted supplementary feeding is also usually provided for women and children with moderate acute malnutrition. In addition, people who have been discharged from a therapeutic feeding programme are also eligible for targeted supplementary feeding.

Various cereal-based blended foods are used as supplementary feed in TSF *woredas*. These cereal blends are composed of precooked cereals and legumes fortified with micronutrients. Commonly used blended foods in Ethiopia are Corn-Soy Blend (CSB), Famix and Unimix. In general, the composition is

constituted from 79% of cereals, 20% legumes and 1% vitamins and minerals. In addition to the blended foods, edible oil is given to moderately malnourished women and children.

Supplementary feeding aims to provide the following nutrients:

- 1000–1200 Kcal with 10–15% from protein, 30–35% from fat and 50–60% from carbohydrates.

The recommended monthly ration to ensure the above nutrient intake is:

- 6–7.5 kg blended food + 0.9 gm oil + up to 0.6 gm sugar per beneficiary per month. Figure 9.2 shows a poster advertising the rations provided in a supplementary feeding programme.

Figure 9.2 Three month rations given in the Targeted Supplementary Feeding Programme. (Source: World Food Programme, 2005/6, *TSF poster*).

For practical reasons, 25 kg of blended food is usually given to each beneficiary to use over the next three months together with three litres of oil. Usually, three or six-monthly community screenings are organised in TSF *woredas* following which the allocation of supplementary food will be made. Children and women with MAM during these screenings are registered and provided with a ration card to ensure they are enrolled into a TSF programme and receive the blended foods and oil. There is no specific discharge criteria in a TSF context; the regular community screenings are used to reassess the nutritional status of children and women, and decide whether they need to continue in (or join) the programme, depending on whether they fulfil the admission criteria.

■ How many kilos of blended food and litres of oil are given for moderately malnourished child getting TSF ration for three months?

□ Twenty five kilograms blended food and three litres of oil is provided for each moderately malnourished child as this is considered to provide sufficient nutrients to improve the child's nutritional status.

Figure 9.3 is a poster showing how rations are used to produce a nutritious supplementary meal.

Figure 9.3 Cooking supplementary rations for the malnourished child. (Source: Source: World Food Programme, 2005/6, *TSF poster*)

Supplementary feeding programme

In some *woredas*, NGOs undertake supplementary feeding programmes (SFPs) to provide support to moderately malnourished individuals. The main difference from the TSF is the opportunity for continuous screening and admission of new cases into supplementary feeding together with continuous follow-up of the weight gain and the condition of the moderately malnourished person. Such a close follow-up also provides an opportunity to assess why a certain child is not progressing as expected and to decide when to discharge those who continue to gain weight.

9.3 Enhanced Outreach Strategy/ Child Health Days (EOS/CHD)

As the name indicates, EOS/CHD is designed to enhance your outreach work as a Health Extension Practitioner to provide certain key activities that contribute to child survival. The Health Extension Programme has activities that should be implemented at household level when doing outreach, and at the health post. For example, an activity you can do during outreach sessions is growth monitoring and promotion; another example would be attending delivery of a labouring woman.

You will be asked to organise CHDs for your *kebele*. You need to have a good understanding of each aspect of the day, so it will run smoothly. You also need to be able to prepare detailed plans for your *kebele*. These will be communicated up to the *woreda* level and will ensure that you receive the required support that you need. While both EOS and CHD signify the same activities, EOS is conventionally used for those *woredas* where three-monthly enhanced outreach has not yet started. CHD is used to indicate those *woredas* that have progressed to three-monthly enhanced outreach. It is planned that all *woredas* will eventually undertake CHD with enhanced outreach every three months. Note that some components will still be undertaken on a six-monthly basis, even in CHD *woredas*.

9.3.1 Components of EOS/CHD

Activities undertaken as part of EOS/CHD include vitamin A supplementation, deworming, screening for acute malnutrition, social mobilisation for routine immunization and the promotion of infant and young child feeding. The opportunity is sometimes used to provide insecticide-treated nets. Screening for acute malnutrition is done only in food insecure *woredas* where there is a TSF programme. The overall objective is to enhance child survival by reducing mortality and morbidity in children under five years of age. Your role as a Health Extension Practitioner is therefore critical in supporting this objective.

This section will help you to consider the practical aspects of planning and undertaking EOS/CHD. As EOS/CHD contains many components, you will not be able to deliver the service alone. As a Health Extension Practitioner you will work with additional volunteer community health workers. The number of volunteers depends on the number of services given in EOS/CHD. Table 9.2 below summarises the target group and frequency of EOS/CHD.

Table 9.2 Target groups and frequency of EOS/CHD.

Components of EOS/CHD	**Target group**	**Frequency**	
		EOS	**CHD**
Vitamin A supplementation	Children six–59 months	Six-monthly	Six-monthly
Deworming	Children 24–59 months	Six-monthly	Six-monthly
Screening for acute malnutrition	Children six–59 months Visibly pregnant women Lactating mothers	Six-monthly	Three-monthly
Social mobilisation for routine immunization	Age group for routine immunization	Six-monthly	Three-monthly
Promotion of infant and young child feeding	Families of under–five children	Six-monthly	Three-monthly
Insecticide-treated nets (ITNs)	Households with under-five child or pregnant woman or lactating mother	Once in three years for long lasting nets	Once in three years for long lasting nets

9.4 Planning for EOS/CHD

There are two key aspects to planning for EOS/CHD. The first is planning what supplies your *woreda* will need, the second is mobilising the community so people know about services and support.

9.4.1 Planning for supplies

Before you can plan what supplies you require you need to know the population figures in each of the target groups. This will enable you to estimate the number of tablets or capsules you may need for EOS/CHD. Non-consumable supplies like the MUAC tapes or scissors are needed only if you do not have them in your health post, or the ones you have are damaged. Planning by outreach site may help you to know the number of items you should take with you when conducting EOS/CHD in a particular village. Figure 9.4 shows you the form you should use to help you plans supplies for your village.

EOS/CHD - Micro planning - Supply needs

REGION: Zone: Woreda: Kebele: Date:

	General information			Vit. A supplementation						Screening	Measles Vaccination				Other supplies					
	Name of Village	Total population	Pop. 6-59 months	Duration	Pop. 6-11 months	Pop. 12-59 months	Vit. A capsules (100,000 IU)	Scissors	Pop. 24-59 months	Albendazole 400mg tablets	MUAC tape (cut-off)	Measles vaccine vials of 10 dos	AD syringes	Mixing syringes	Safety boxes	Vit. A and dewo tally	Screening tally sheet	screening registration book	Measles tally sheet	Supervisory checklist	Reporting format
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1																					
2																					
3																					
4																					
5																					
6																					
	Kebele Total																				

Figure 9.4 Example of micro-planning template for supplies need. (Source: Federal Ministry of Health, March 2006, *Guidelines for the enhanced outreach strategy (EOS) for child survival interventions*)

- What supplies will you need for undertaking EOS/CHD?
- The supplies needed include vitamin A capsules, deworming tablets, MUAC tapes, and posters. If ITN distribution is integrated, you will need the ITNs. Albendazole 400 mg, or Mebendazole 500 mg tablets are the most commonly used deworming tablets. You will also need scissors to cut the vitamin A capsules.

You may have also listed weight and height measuring instruments to be used in screening for acute malnutrition. In EOS/CHD these items of equipment are not needed however, because weight-for-height is not one of the measurements used. This is because this measurement takes time to do, and the likelihood of making mistakes in such community screenings is high. There are three instances where there is a risk of making mistakes when measuring weight-for-height; these are when you are taking weight, measuring height and computing the final measurement. Screening for acute malnutrition is done only in food insecure *woredas* where there is a TSF Programme.

9.4.2 Social mobilisation

Social mobilisation is a critical component of EOS/CHD where the community needs to get clear messages about *what* are the services; *who* will receive the services; *when* the service day for the community will be; *where*

the EOS/CHD will be held for the community being mobilised (see Figure 9.5).

The opportunity is also used to increase the community awareness of the benefits of the components of EOS/CHD and also to increase demand for health services, particularly routine immunization. Community health workers play a critical role in social mobilisation. As a Health Extension Practitioner you may also disseminate the information using the *kebele* administration and village elders and leaders.

Figure 9.5 Health worker explaining the components of EOS/CHD in Tigray. (Photo: UNICEF Ethiopia / Indrias Getachew)

- What is the purpose of community mobilisation?

- An important purpose is to bring children to a central place so they can receive the services they need. These services will be based on eligibility criteria. It also provides parents and caregivers an opportunity to ask about any concerns they have about their children's health.

Depending on the size of the *kebele*, you may subdivide your outreach into a group of villages (**outreach site**), and decide on a different central location for each of the grouped villages. You should organise yourself to complete the EOS/CHD for all the outreach sites within a short period of time, usually over a maximum of one week.

It is important that the community is informed of the date of the EOS/CHD in advance. Failing to complete an outreach site visit that was in your initial plan could disrupt your next outreach site visit where people will be waiting for you. Therefore, you need to make a realistic plan and stick to this as closely as you can.

9.5 EOS/CHD service organisation

There are a number of aspects you need to consider when planning EOS/CHD service organisation. This section will help you to ensure you make realistic and effective plans.

9.5.1 Outreach site organisation

When selecting an outreach site for EOS/CHD, you should consider the adequacy of the space and suitability of the location for your work in the community. Whenever possible, you should involve the local community leaders in the selection of the site. It should be easily accessible to the

community. The outreach site should preferably be in a building or on a veranda or under good shade. It should also have a clear banner/poster indicating that it is outreach site.

- Can you give some examples of buildings that could be used as an outreach site?

- There will be a number of possible sites in most locations. For example, a school, a *kebele* administration office, a health post or a church/mosque could be used as outreach sites/posts.

After selecting the site, you need tables and chairs to be arranged in an organised manner so that you can provide the services. You should consider a number of important factors when arranging the flow of the service. First of all you should consider what services are going to be provided in a specific EOS/CHD. As you may recall, some services (such as providing insecticide-treated nets) will not be given in a EOS/CHD. You need to organise the services in a logical order, from a service where a child is least likely to cry, to a service that may create discomfort to a child. For example if there is measles immunization, it should be the last service, as children are likely to cry after the injection and may refuse other services. Figure 9.6 below illustrates how the site and flow of services could be organised.

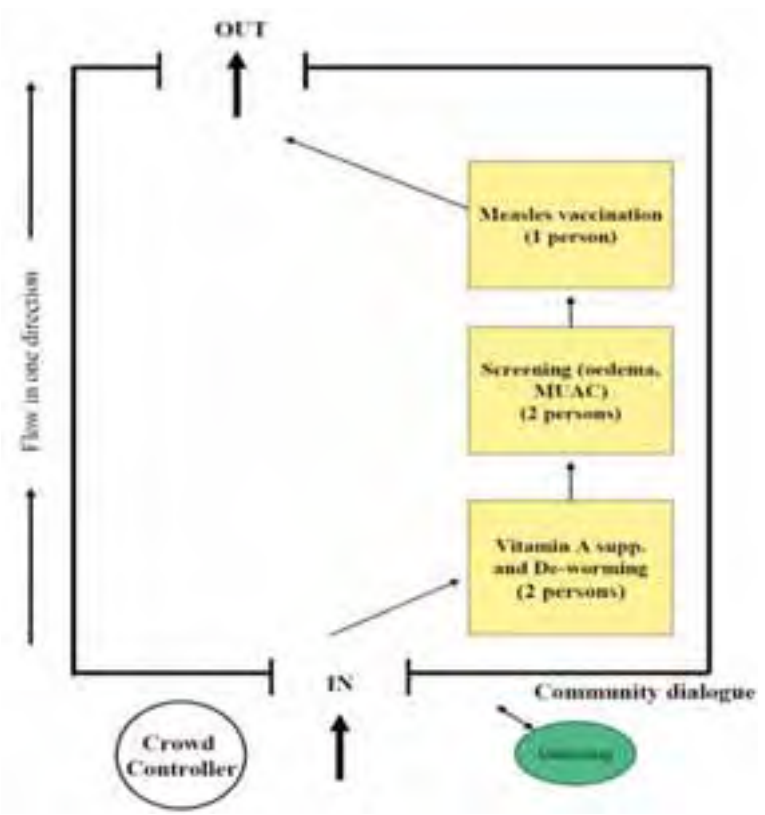


Figure 9.6 Flow of services for EOS/CHD. (Source: Federal Ministry of Health, March 2006, *Guidelines for the enhanced outreach strategy (EOS) for child survival interventions*)

Since mothers may not remember the accurate age of a child in many rural communities, **height-age** is used as an objective way of excluding children older than 59 months from the service. Height-age is when the age of a child is estimated from its height. A child is expected to be 100 cm tall at the age of five years (60 months). Children taller than 110 cm should not be allowed to receive EOS/CHD services. In some EOS/CHD sites, health workers put up

a height age measuring device that looks like a football goal, where the cross-bar is 110 cms high. As you can see in the picture in Figure 9.7, two bamboo sticks are connected with a rope as a cross bar. The rope is measured to be 110 cm from the ground.

Figure 9.7 Health worker doing height screening to identify children under-five years old and checking MUAC for eligible children in Gursum *woreda* of Oromia region, May 2006. (Photo: UNICEF Ethiopia / Tewoldeberhan Daniel)

9.5.2 Crowd control

The best way to control the crowd is to start the service at the right time. This will help to minimise the length of time mothers and caregivers will have to wait for screening (see Figure 9.8). You should ensure there is enough space between each of the teams providing the different services. As much as possible, arrange the services to facilitate one direction of flow of clients with clear entry and exit points, as you saw in Figure 9.6.

Figure 9.8 Crowd waiting for screening for malnutrition by health worker Damot Fullassa, April 2008. (Photo: UNICEF Ethiopia / Tewoldeberhan Daniel)

9.6 Registration and referral of cases with acute malnutrition

In Targeted Supplementary Feeding (TSF) *woredas* where screening for acute malnutrition is integrated with EOS/CHD, the results of your screening are used to identify the people who will get the targeted supplementary foods. Therefore you will be provided with a registration book for you to register all children with malnutrition. Children with either severe acute malnutrition or moderate acute malnutrition are eligible for targeted supplementary feeding and should have their name entered in the registration book.

When you write in the registration book, the information will automatically be carbon copied onto three additional coloured sheets. When you look at a registration book you will see four different coloured sheets. After writing your entries you should send each sheet to different stakeholders, as described below.

- The white coloured sheet remains with the registration book for your records
- The light blue sheet is sent to the *woreda* food security desk
- The pink sheet is given to the *woreda* health office
- The yellow sheet is sent to the regional Disaster Risk Management and Food Security Sector (DRMFSS) office.

You should keep the white sheet and submit the other three to your supervisor. He or she will make sure they are sent to the correct recipients. In some *woredas*, the Food Distribution Agents may take the light blue sheet. Food Distribution Agents are women that are selected from the community to manage the storage and distribution of targeted supplementary foods. They will only give TSF foods for the women and children who are on your list.

You must give a ration card to people with severe acute malnutrition and moderate acute malnutrition. Families will keep these cards to show to the Food Distribution Agent (FDA), so you must make sure that the ration card is not given to someone who is not eligible.

All children and adults with severe acute malnutrition should be treated. If your health post has an Out-patient Therapeutic Programme (OTP) where you can manage cases with severe acute malnutrition, provide the first day treatment and make an appointment for a subsequent follow-up visit.

Study Session 10 looks at how to treat cases with severe acute malnutrition in your health post. For now, you just need to know that if your health post is not yet able to treat cases of severe acute malnutrition, you should refer the child to a nearby health facility where they can access treatment for the appropriate services.

9.7 Reporting

After completing your EOS/CHD activities you have to submit a report. There is a standard reporting template that you will use to fill out the number of children that received each of the components against the target. The performance of your *kebele* is normally measured by looking at what proportion of the target population that need to receive services have actually received the relevant interventions. You will therefore record information on the reporting template that enables this information to be checked.

In this study session you have learnt about the different anthropometric indices to determine the nutritional status of women and children. You have seen that as a Health Extension Practitioner you have a critical role in helping people in your community who have moderate acute malnutrition. If you apply what you have learned in this and earlier sessions in this Module, you will be able to mobilise and support your community effectively.

Summary of Study Session 9

In Study Session 9 you learned that:

1 Anthropometric indices such as mid-upper arm circumference, weight and height are used to determine the nutritional status of women and children.

2 The severity of the malnutrition is decided against a set of criteria, including weight for height and body mass index (BMI).

3 The presence of oedema always signifies severe acute malnutrition.

4 The target group for managing moderate acute malnutrition is children under five, pregnant women and lactating mothers.

5 When managing someone who has moderate acute malnutrition, you should identify any problems in the home that led to the malnutrition and then counsel the use of high-energy foods to address the problem.

6 Some *woredas* have Targeted Supplementary Feeding or Supplementary Feeding Programmes which provide additional opportunities for ensuring moderately malnourished people receive energy rich supplementary foods.

7 Enhanced Outreach Strategy (EOS) and Community Health Days (CHD) require careful planning to ensure as many adults and children as possible attend and receive services in an ordered and effective way.

8 It is important to record accurate information in the registration book, which is then shared with different stakeholders, such as the *woreda* food security desk and the health office.

Self-Assessment Questions (SAQs) for Study Session 9

Now that you have completed this study session, you can assess how well you have achieved its Learning Outcomes by answering the questions below. Write your answers in your Study Diary and discuss them with your Tutor at the next Study Support Meeting. You can check your answers with the Notes on the Self-Assessment Questions at the end of this Module.

SAQ 9.1 (tests Learning Outcomes 9.1 and 9.4)

What are the principles of treatment of moderate acute malnutrition?

SAQ 9.2 (tests Learning Outcomes 9.2 and 9.3)

Read Case Study 9.1 and then answer the questions that follow.

Case Study 9.1 Jemila's story

Jemila Ahmed is a 30 months old girl who came to your EOS/CHD service. Her MUAC was 11.5cm but she did not have oedema. Weight-for-height was not done as it is not part of EOS/CHD

(a) How would you classify Jemila's level of malnutrition?
(b) What actions could you take on the Child Health Day to help improve Jamila's health?

SAQ 9.3 (tests Learning Outcome 9.4)

How can a child's moderate acute malnutrition be managed if there is no supplementary feeding programme in your community?

SAQ 9.4 (tests Learning Outcomes 9.5 and 9.6)

Describe how you would organize services for a Child Health Day (CHD).

Study Session 10 Managing Severe Acute Malnutrition

Introduction

In the last session you learnt about the use of anthropometric indices to determine the nutritional status of women and children. You also considered some of the most important methods and principles for managing moderate acute malnutrition (MAM). This session is devoted to giving you a deeper understanding of the way that you can look after children who have developed severe acute malnutrition (SAM). This will start from the steps you need to take to assess for complications and to do the appetite test, so that you are able to identify children who need referral for in-patient management. Then you will learn how to manage the children with severe acute malnutrition who can be cared for in your out-patient therapeutic programme (OTP). Lastly, you will learn how to manage severely malnourished children in OTP using weekly follow-up visits until they reach the discharge criteria.

Learning Outcomes for Study Session 10:

When you have studied this session, you should be able to:

10.1 Define and use correctly all of the key words printed in **bold**. (SAQ 10.2)

10.2 List the steps for identifying severely malnourished children who require in-patient treatment, and differentiate them from those children who can be treated on an out-patient basis. (SAQs 10.1 and 10.2)

10.3 Describe the admission, referral, and discharge criteria to and from the out-patient therapeutic programme (OTP). (SAQ 10.2)

10.4 Explain the key management and follow-up actions for severe acute malnutrition (SAM) using the OTP protocol. (SAQs 10.3 and 10.4)

10.5 List what information should be entered in the recording and reporting formats. (SAQs 10.3 and 10.4)

10.6 Outline the procedures to organise a health post set up for out-patient treatment of SAM. (SAQ 10.5)

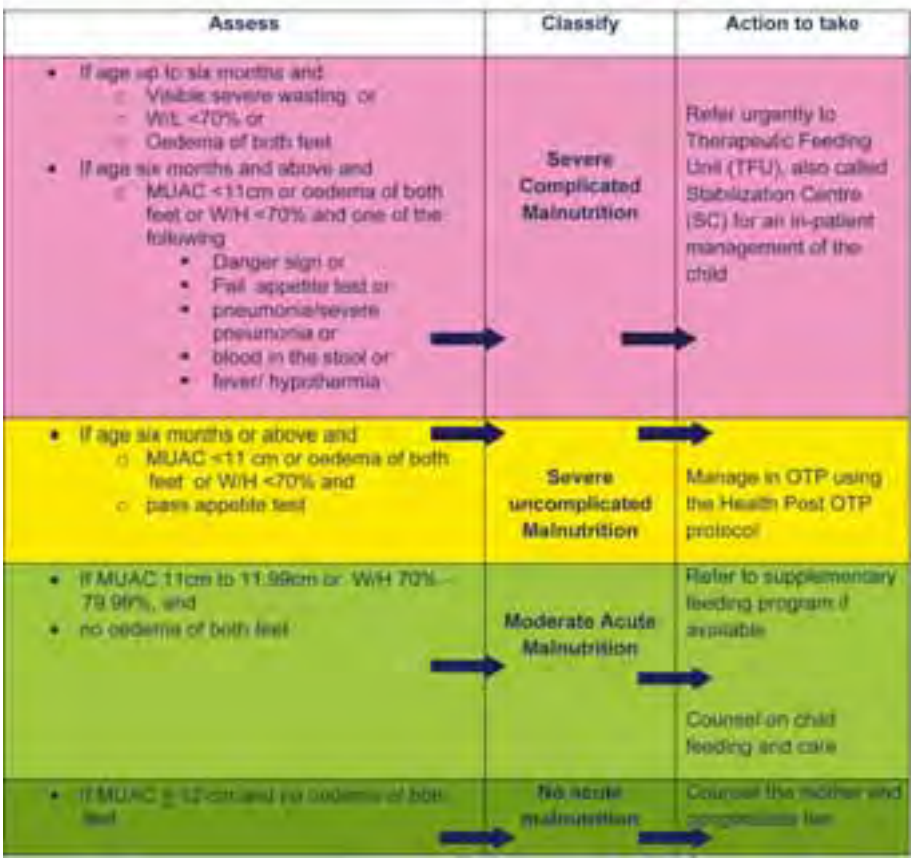
10.1 Severe acute malnutrition: deciding patient management

When thinking about severe acute malnutrition you should have in mind all the vital organs in the body such as the heart, the kidneys and the liver. When a child or adult is severely malnourished, these organs do not function properly. Therefore severely malnourished children are at an increased risk of death if their malnutrition is not identified and treated in a timely way. You need to know the steps required to assess, classify and treat severely malnourished children.

Your first step is to decide whether to provide out-patient management or refer the child to an in-patient facility. Look at the flow chart in Table 10.1 overleaf which shows you how to classify the condition of a child and the recommended action you need to take. If you read the table from left to right, you can see how your assessment of the child's symptoms will enable you to

classify the level of malnutrition and whether you need to refer the child to an in-patient facility.

Table 10.1 Flow chart for assessment, classification and action required for malnourished children. (Source: Federal Ministry of Health, 2008, *Management of severe acute malnutrition*)



- Which children with the classification of severe acute malnutrition can be treated at health post level?
- As you can see from the flow-chart in Table 10.1, you can treat children with severe uncomplicated malnutrition at health post level, but children with severe *complicated* malnutrition need to be referred urgently to TFU.

The Federal Ministry of Health has produced guidance (July 2008) on the management of children with severe acute malnutrition at a health post. This provides additional information not covered in this study session.

10.2 Management of severe acute malnutrition

It will not always be easy for you to decide who should be referred to a higher level, or who you should treat yourself at the health post. As you read above this will mainly (but not only) depend on whether the child's severe acute malnutrition is 'complicated' or 'uncomplicated'. Certain criteria have been established to help you decide whether a child has severe complicated or severe uncomplicated malnutrition:

- Age: all infants under six months of age with SAM need to be treated in an in-patient facility

- The presence of any medical complications, including any of the general danger signs, pneumonia/severe pneumonia, blood in the stool, fever or hypothermia mean that the severely malnourished child is classified as severe complicated malnutrition and must be treated in an in-patient facility. The *IMNCI* Module looks at each of these complications in more detail. Table 10.2 below gives you a summary of the key complications that you should look for when helping to treat children with severe acute malnutrition.

Table 10.2 Complications and indicators for referral of children with SAM.

Complication	Referral to in-patient care when:
General danger sign	If one of the following is present: vomiting everything, convulsion, lethargy, unconscious, or unable to feed
Pneumonia	Fast breathing For child six–12 months 50 breaths per minute and above For a child 12 months–five years 40 breaths per minute and above For a child older than five years 30 breaths per minute and above
Severe pneumonia	A child with fast breathing as indicated above and chest in-drawing
Dysentery	If blood in the stool
Fever or Low body temperature	T° ≥ 37.5 or febrile to touch T° ≤ 35°C or cold to touch

≥ means greater than or equal to. ≤ means less than or equal to.

Children with poor appetite are also classified as having severe complicated malnutrition and need to be referred to in-patient care. Details on how to test for appetite will be explained briefly below.

10.2.1 The appetite test

Appetite is a very important indicator of the clinical situation of a child who may have malnutrition. A poor appetite means that the child has a serious problem and will need to be referred for inpatient care. Remember that a child who has complications does *not* need to be given the appetite test and should be referred for in-patient care.

A severely malnourished child who has complications should be referred for in-patient care.

The appetite test: steps to follow

1 The **appetite test** should be conducted in a separate quiet area.

2 Explain to the caregiver the purpose of the appetite test and how it will be carried out.

3 The caregiver should wash their hands.

4 The caregiver should sit comfortably with the child on their lap and should either offer the *ready-to-use therapeutic food (RUTF)* from the packet or put a small amount on his finger and give it to the child.

5 The caregiver should offer the child the RUTF gently, encouraging the child all the time. If the child refuses then the caregiver should continue to quietly encourage the child and take time over the test. The test usually takes a short time but may take up to thirty minutes. The child must not be forced to take the RUTF.

6 The child needs to be offered plenty of water to drink from a cup as he is taking the RUTF.

10.2.2 Interpreting the result of the appetite test

Table 10.3 below shows you how to determine whether the child passes or fails the test.

Table 10.3 Appetite test table.

Minimum amount that a malnourished child should take to pass the appetite test			
RUTF		**BP 100**	
Body weight (kg)	**Sachet**	**Body weight (kg)**	**Bars**
< 4	⅛–¼	< 5	¼–½
4 up to 10	¼–½	5 up to 10	½–¾
10 up to 15	½–¾	10 up to 15	¾–1
> 15	¾–1	> 15	1–1 ½

Passes the appetite test

A child that takes at least the amount of RUTF shown in the appetite test table passes the appetite test.

You should explain to the caregiver that the treatment option for the child is OTP. You would then register the child's OTP card (you will learn how to do this later in this study session).

Fails the appetite test

A child who does not take the amount of RUTF shown in the appetite test table fails the appetite test. You should explain to the caregiver that the choice of treatment for the child is in-patient care; and explain the reasons for recommending this. You would then refer the child to the nearest therapeutic feeding unit / stabilisation centre (TFU/SC) for in-patient management. This is a unit in a health centre or hospital where severely malnourished children with complications or poor appetite are referred and managed. Once the complications improve, these children will be referred back to you for continued out-patient follow-up in your health post.

You may have seen a video on outpatient management of severe acute malnutrition in a training session. If not, when at the health centre try to use the opportunity to see the video if it is available. You will be able to see a child who passes the appetite test and another child who fails the appetite test.

10.3 Management of severe acute malnutrition in OTP

After completing the anthropometry, checking for complications and doing the appetite test, you will know which children with severe complicated malnutrition will be in need of immediate referral and those with severe uncomplicated malnutrition that can be treated at the health post level. As you read earlier, the out-patient treatment programme based on your health post or any other out-patient facility is called an OTP (out-patient therapeutic programme). Once a child is identified as having severe uncomplicated malnutrition, you should explain the condition of the child to the caregiver; register the child in the registration book and also on an individual patient follow-up card called the OTP Card (you will look at how to do this in Section 10.5 below).

10.3.1 Admission procedures

An important part of your role is to explain to the caregiver how to help with the OTP treatment.

You should always make sure that the caregiver is fully aware of the condition of the child, and the need for weekly follow-up visits until the child reaches the discharge criteria. If the condition of the child progresses smoothly, the child normally recovers within five to seven weeks. Some children could take longer, however, and after eight weeks, if there has been nor or little improvement, you will need to stop the OTP treatment and refer the child to TFU. In addition to the need for weekly follow-up visits, you should make sure that the caregiver clearly understands the dosage and frequency of each of the drugs as well as the weekly ration of RUTF to give to the child. It is usually good to ask the caregiver to repeat to you how they will administer the RUTF and drugs after you have finished explaining the details to them. This will enable you to verify if the message has been correctly understood by them.

You also need to register the child and fill out the OTP card (the child's follow-up card) on the admission day, and continue to use this in the regular follow-up of the child (see Section 10.5 below).

10.3.2 Ready-to-use therapeutic food

Ready-to-use therapeutic food (RUTF) is given during out-patient management of a severely malnourished child. The most commonly known brands of RUTF are Plumpy'nut® and BP-100® (see Figure 10.1). RUTF is ready to use, as its name indicates. That means it does not need cooking, or any other process before feeding the child. It is high energy food contained in a concentrated form, enriched with minerals and vitamins to replenish a severely malnourished child. Table 10.4 below shows you how much RUTF should be given to a child according to their weight in kg.

Figure 10.1 Plumpy'nut® and BP-100®. (Photo: UNICEF Ethiopia / Dr Tewoldeberhan Daniel)

Table 10.4 Amount of RUTF to be given to each child based on their weight.

Class of weight (kg)	**Plumpy'nut®**		**BP-100®**	
	sachet per day	**sachet per week**	**bars per day**	**bars per week**
3.0–3.4	1¼	9	2	14
3.5–4.9	1½	11	2½	18
5.0–6.9	2	14	4	28
7.0–9.9	3	21	5	35
10.0–14.9	4	28	7	49
15.0–19.9	5	35	9	63

You should explain to the caregiver the following key messages about RUTF so they are able to help with the treatment.

- RUTF is a food and medicine for malnourished children only. It should not be shared
- For breastfed children, always give breastmilk before the RUTF and breastfeed on demand
- RUTF should be given before other foods. Give small regular meals of RUTF and encourage the child to eat often, every three to four hours
- Always offer plenty the child plenty of clean water to drink while eating RUTF
- The caregiver should use soap and water to wash their hands before feeding the child
- Keep food clean and covered
- Sick children get cold quickly, so it is important to keep the child covered and warm at all times.

10.3.3 Routine drugs

In addition to the RUTF, severely malnourished children need to be routinely given drugs using the administration schedule outlined in Table 10.5 overleaf.

Table 10.5 Routine drugs to be administered to children with severe acute malnutrition.

Drug	Treatment
Vitamin A	Ask if it has been given in the last six months Give one dose at admission if one not given previously Do not give a dose of vitamin A if the child has oedema
Folic acid	One dose at admission
Amoxicillin	One dose at admission and give seven days treatment to take home
	The first dose should be given in the presence of the supervisor
De-worming	One dose in the second week (second visit)
Malaria	According to national protocol (see the study session on malaria in the IMNCI module)
Measles (from nine months old)	Ask if the child has been vaccinated
	Give one vaccine on the fourth week (fourth visit) if not given previously
Iron	Not given – iron is already in all RUTF

As you see from the information in Table 10.5, if a child is admitted to your health post for treatment of severe acute malnutrition you should always give them a dose of vitamin A, unless the child has oedema or has received vitamin A in the previous six months.

A severely malnourished child should be given antibiotics even if there are no signs of infection.

Note that severely malnourished children should be given antibiotics (Amoxicillin) even if they do not have signs of infection such as fever. Fever results from an immune response of the body to an infectious agent. As a severely malnourished child has a very weak immune system, it often fails to develop a fever response. Therefore a severely malnourished child should be given antibiotics without waiting for typical signs of infection.

Always make sure that the caregiver gives the child the first dose of the drugs in your presence. This will give you an opportunity to make sure that they are able to administer it appropriately. The caregiver can then confidently replicate what they have done in your presence, when caring for the child at home.

- After completing the anthropometry and deciding whether a child is severely malnourished, what must you do next to decide whether a child needs to be treated as an in-patient?

- You should first consider the child's age because children under six months with SAM always need to be cared for in an in-patient faculty. You would then check for the presence of complications and finally you would do the appetite test.

10.4 Follow-up of severely malnourished children in an OTP

There are a number of steps you need to take when following up the treatment and care of severely malnourished children in an OTP. These are outlined below.

10.4.1 Weekly follow-up

The information mentioned in these steps is also indicated on the OTP card which will help you to remember all the essential points to check.

Step 1: Ask about

- Diarrhoea, vomiting, fever or any other new complaint or problem the child may have
- Whether the child is finishing the weekly ration of RUTF.

Step 2: Assess for

- Complications
- Temperature, respiration rate
- Weight, MUAC and oedema.

You should then do the appetite test.

Step 3: Decide on what action to take based on the above follow-up assessment

Refer if there is any one of the following:

- Development of any complications
- The child fails the appetite test
- There is an increase in the level of oedema. For example, if the oedema was only on the feet during admission, and the child has developed increased swelling on higher parts of the body such as the legs or the face
- A child who did not have oedema on the preceding visit is now presenting with oedema on the current visit
- A child without oedema loses weight for two consecutive visits. A child with oedema has abnormal fluid accumulated in the body. As a result, when the condition starts to resolve with the treatment you are administering, and the oedema fluid starts to be lost from the body, you might expect to see a decrease in body weight
- A child with oedema, or one who has recovered from oedema, fails to gain weight for three consecutive visits
- Major illness or the death of the main caregiver so that the child can't be managed at home.

If there is no indication for referral, provide the weekly follow-up OTP services. These include:

- Providing any routine drug that needs to be given on the current visit according to the guidance in Table 10.5
- Providing the weekly ration of Plumpy'nut®
- Making an appointment for next weekly follow-up

- Recording the relevant information on the OTP card.

If the child is absent for any follow-up visit:

- Ask a Community Volunteer to do a home visit and report back to you
- If there is another child with severe uncomplicated malnutrition in your follow-up from the same neighborhood, you may also ask the caregivers why their neighbour didn't come to OTP follow-up.

10.4.2 Home visits

You may face a difficult situation where the family of a child who needs referral refuses to take the child to an in-patient facility. Or sometimes you may not be sure about the presence of a particular complication and whether to refer a child or not. In such instances, you need to organise a home visit in between the OTP days to follow the progress of the child. If a child is not gaining weight while taking the Plumpy'nut®, you may also want to do a home visit to understand if there is inappropriate sharing of food at home which means the child is not receiving enough nutritious meals.

In all instances of home visits, try to assess the child in exactly the same way that you would assess them during a routine weekly follow-up in your health post. In addition, do your best to provide psychological support to the family in order to encourage them to care for the child properly. Discuss with the family if there are any factors that are preventing them from following your earlier advice.

10.4.3 Discharge

You should discharge the child from OTP follow-up if the following criteria are fulfilled:

- For those who were admitted based on oedema: discharge if there is no oedema for two consecutive visits (14 days)
- For those who were admitted without oedema: discharge when the child reaches discharge target weight.

If the child fails to reach the discharge criteria after two months of OTP treatment, you should refer the child for in-patient care and undertake more detailed follow-up to investigate the cause.

On discharge make sure:

- Counselling is given to the mother or caregiver about child feeding and care
- Wherever the service exists, give a discharge certificate to the caregiver and make a referral to the supplementary feeding programme
- Each child is registered appropriately in the registration book on date of discharge.

10.5 Recording and reporting

Keeping accurate records for each patient with OTP who visits your health post and for each home visit you make is a key part of your job. There are a number of different forms for recording information and in this section you are going to learn about these and why it is important to keep good records.

10.5.1 The registration book

The registration book is used to keep a record of children with severe uncomplicated malnutrition who are admitted to the OTP in your health post. The registration book is filled in only on date of admission and date of discharge. The information in the registration book will enable you to prepare monthly reports and analyse the performance of your OTP. The registration book is arranged in such a way that the admission information is written on the left-hand side page of the book while discharge information for the same child is completed on the next sheet on the right-hand side. You can see this in Figures 10.2 and 10.3, which reproduce sections from the registration book. Alternate rows are coloured to ease completion of information both on the date of admission and on the date of discharge.

REGISTRATION BOOK FOR THERAPEUTIC FEEDING

Serial #	Facility Registration #	Full Name	Address	Age (months/Years)	Sex (F/M)	New admission Y/N	Transfer or re-admission Y/N	Admission			
								Date	Weight (Kg.g)	Oedema (+,++,+++)	MUAC (C.M.)
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

Figure 10.2 Registration book for therapeutic feeding (part 1). (Source: Federal Ministry of Health)

REGISTRATION BOOK FOR THERAPEUTIC FEEDING
ውሎንብ የሕፃናት ህክምና ፕሮግራም መዝገብ

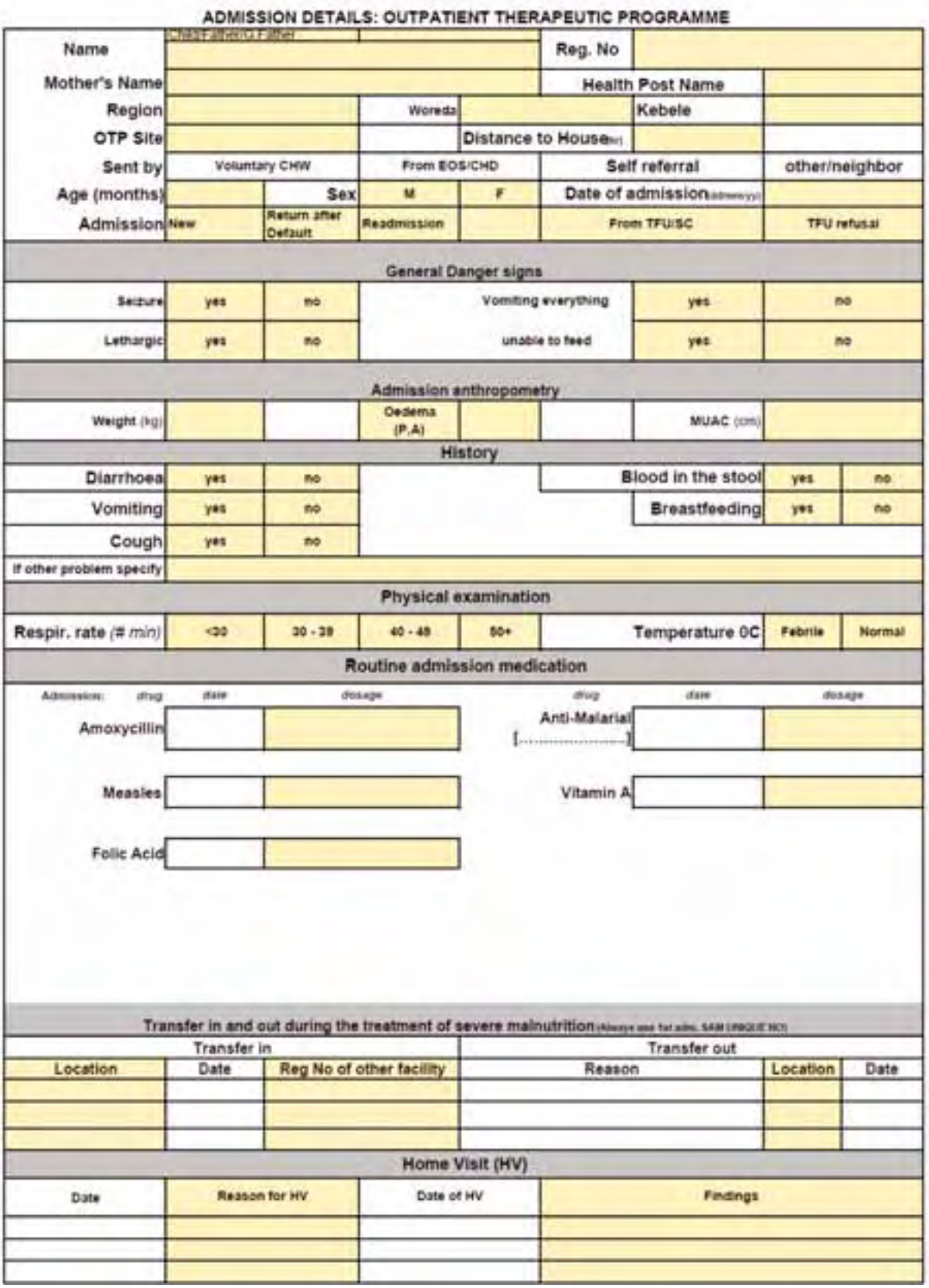
Serial # ተ.ቁ.	Discharge / የወጣ				Outcome (cured, dead, defaulter, unknown, non-responder, medical transfer, transfer out) ውጤት (የዳነ/የሞተ/ያቋረጠ/ያልታወቀ/ለሕክምና ወደ ጠና ድርጅት የተላከ/የተዛወረ)	Remarks ምርመራ
	Date ቀን	Weight kg.g ክብደት (ኪ.ግ.)	Oedema 0,+,++, +++ እብጠት (አለ/የለም)	MUAC cm ላክሜል (ሳ.ሜ.)		
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Figure 10.3 Registration book for therapeutic feeding (part 2). (Source: Federal Ministry of Health)

10.5.2 The OTP card

The OTP card is a patient follow-up card that is used to help in your management of severe uncomplicated malnutrition. This card basically provides you with an opportunity to record information about children efficiently on a weekly basis. There is space for each key indicator to be filled out in an organised manner. Most of the front page of the OTP card is filled in on the date of admission. It provides relatively detailed information on the child's identity, clinical history, physical examination, the anthropometric indicators warranting admission and also the medication given on the date of admission. You can see a copy of this part of the OTP card in Figure 10.4.

You can also see that low down on the front page there is space to write whether the child is transferred or not, and another space to write your findings in case you decide to do a home visit.



ADMISSION DETAILS: OUTPATIENT THERAPEUTIC PROGRAMME

Name	Child's name / father				Reg. No			
Mother's Name					Health Post Name			
Region			Woreda		Kebele			
OTP Site				Distance to House(hr)				
Sent by	Voluntary CHW		From EOS/CHD		Self referral		other/neighbor	
Age (months)		Sex	M	F	Date of admission(dd/mm/yy)			
Admission	New	Return after Default	Readmission		From TFU/SC		TFU refusal	
General Danger signs								
Seizure	yes	no	Vomiting everything			yes	no	
Lethargic	yes	no	unable to feed			yes	no	
Admission anthropometry								
Weight (kg)			Oedema (P,A)			MUAC (cm)		
History								
Diarrhoea	yes	no			Blood in the stool		yes	no
Vomiting	yes	no			Breastfeeding		yes	no
Cough	yes	no						
If other problem specify								
Physical examination								
Respir. rate (# /min)	<30	30 - 39	40 - 49	50+	Temperature 0C		Febrile	Normal

Routine admission medication

Admission:	drug	date	dosage	drug	date	dosage
Amoxycillin				Anti-Malarial [.....]		
Measles				Vitamin A		
Folic Acid						

Transfer in and out during the treatment of severe malnutrition (Always use for adm. SAM (RUTF/F-NC))

Transfer in			Transfer out		
Location	Date	Reg No of other facility	Reason	Location	Date

Home Visit (HV)

Date	Reason for HV	Date of HV	Findings

Figure 10.4 The OTP card: admission transfer details. (Source: Federal Ministry of Health)

The back of an OTP card is dedicated to the weekly follow-up visits of children with severe uncomplicated malnutrition. There are twelve columns, representing one week each (see Figure 10.5).

NAME							Target Weight					
Week	admi	2	3	4	5	6	7	8	9	10	11	12
Date												
Anthropometry												
Weight (kg)												
Weight change *(+/0/-)												
MUAC (cm)												
Oedema (Yes, No)												
* Check for failure to respond (weight loss since admission for wasted children, failure to start to loose oedem on day 14;failure to gain any weight, edema still present on day 21)												
General Danger Signs												
Seizure												
Lethargic												
Vomiting everything												
Unable to feed												
History												
Diarrhoea (# days)												
Blood in stool (y,n)												
Vomiting (# days)												
Fever (# days)												
Cough (# days)												
Physical examination												
Appetite test Pass/Fail												
Temperature °C												
Respiratory rate (# / min)												
ACTION NEEDED** (Y/0)												
Routine Medication												
Amoxi dose												
Malaria trt dose												
Vitamin A				•								
Deworming		•										
Measles	•			•								
Folic Acid												
Other medication (see front of card)												
RUTF (# packets)												
Name examiner												
OUTCOME ***												

*** A=absent DF=defaulter (Patient that is absent for two 21 days in out-patient confirmed by a home visit.) T=transfer to TFU X=died C=discharged cured RT=refused transfer HV= home visit NR=Non-responder(did not fulfill discharge criteria after 8 WKs treatment) U= Unknown (Patient that is absent for 21 days in out-patient but his outcome (actual defaulting or death) is not confirmed/ verified by a home visit)

** Action taken during follow-up *(include date)*

Figure 10.5 OTP follow-up details. (Source: Federal Ministry of Health)

- Why won't you be expected to manage children who are less than six months of age at your health post?

- As you may remember, all children under six months old classified as having severe acute malnutrition have to be referred for in-patient care.

- What is the maximum stay on OTP if a child does not reach the discharge criteria?

- It is eight weeks, because if the child fails to reach the discharge criteria after this time they should be referred for in-patient care and detailed follow-up.

10.5.3 Monthly reporting

When reporting on children with severe uncomplicated malnutrition, you need to follow a standard format. Information provided by you will include data on new admissions, transfer to in-patient facilities, children cured, children defaulting from treatment and the number of children who have died. The OPT card data is recorded according to the child's age group and enables a picture to be built up in relation to the outcomes for children in the programme. It is therefore important that you keep accurate and clear records.

- What admission procedures should you undertake once you classify a child as having severe uncomplicated malnutrition?

- You would be able to manage this child at your health post. You would need to explain the procedures of OTP treatment to the child's caregiver, register the child in the registration book and issue an OTP card for detailed follow-up visits.

10.6 Organisation of the health post to manage cases in OTP

You need to be organised so you can manage children with severe uncomplicated malnutrition effectively in your health post. Being organised will help you to anticipate the items you need, and arrange the timing of visits so that your work is efficient and the children you manage receive optimum care.

10.6.1 Supplies

Table 10.6 overleaf sets out the items you need to treat children with severe acute malnutrition in your health post. The minimum stock indicated has been calculated by assuming you have a caseload of 30 severely malnourished children in your health post. Experience shows that the caseload varies significantly from *woreda* to *woreda*; however, your health post may have a much lighter caseload. Based on the caseload in your health post, you should talk with your supervisor and *woreda* health office to ensure availability of the items set out below.

Table 10.6 Items needed in a health post to treat severe acute malnutrition.

Item	Minimum stock/month
Ready to use therapeutic foods	4 cartons/week or 16 cartons/month
Amoxicillin	½ tin
Mebendazole 100 mg	1 tin of 100 tablets
Folic Acid	15 tabs
Vitamin A capsule	30 capsules
Measles vaccine vials (10 doses)	(Number of targeted children × measles coverage / 10) +10%
Plastic cups	2
Drinking water	1 Jerry can
Salter scale (25 kg) plus pants or plastic basin	1
MUAC tape	2
Thermometer	1
Soap for hand washing	1
OTP card	30
Registration book	1
Stock card/supply register	1

10.6.2 Community mobilisation

Community mobilisation is a process of capacity building in which individuals, groups and communities carry out activities on a voluntary, fully participatory basis for a commonly agreed goal. The goal of community mobilisation in the context of the management of severe acute malnutrition is to raise awareness of what malnutrition is and where and how to seek treatment using the OTP services available at the health post. Raising awareness, early case detection, giving information on appropriate childcare, reduction of defaulting and creation of a sense of ownership by the community are among the aims of community mobilisation.

To instigate community mobilisation effectively you need to map what formal and informal communication structures exists in the community. You need to identify respected men and women in the community that people would listen to. If you convince them of the need for managing severe acute malnutrition, then it will be a lot easier for you to convince other residents in the same community. You can even ask the respected elders to talk to their villagers. For example, you could use the formal communication channels — including the *kebele* administration and Gott leaders — and ask them to use one of their meetings to pass on key messages.

The content of the key messages may be different depending on your aims, for example, whether you want to emphasise the importance of follow-up of children on treatment, or raise community awareness on the subject of acute malnutrition. Community mobilisation is looked at in more detail in the *Health Education* Module.

10.6.3 Assignment of OTP days

All OTP cases of severe uncomplicated malnutrition need to have a weekly follow-up at the health post. It is usually advisable to fix one day every week for the OTP activity, including follow-up. For example, you may choose every Tuesday to be an OTP day. This will enable caregivers to remember the day of their appointment. If they miss one of the appointments, they can then come on the subsequent Tuesday. If you identify a severely malnourished child on another day of the week, you may decide to give a ration adequate until the usual OTP day, or you may decide to give RUTF ration to cover until the next OTP day in the subsequent week so that the child is not brought back to the health post twice in a a few days. For example, if you identify a severely malnourished child on a Friday while your usual OTP day is on Tuesday, you may decide to give RUTF ration for ten days so that the child comes on the Tuesday that falls ten days later. After that, you can continue the weekly follow-up for the child on every Tuesday. Remember to consider important events in the community that may affect attendance when choosing the most effective OTP day, such as market day or a religious worship day.

This study session looked at the important steps you should take when managing a child with severe acute malnutrition. The flow chart in Figure 10.6 summarises these steps.

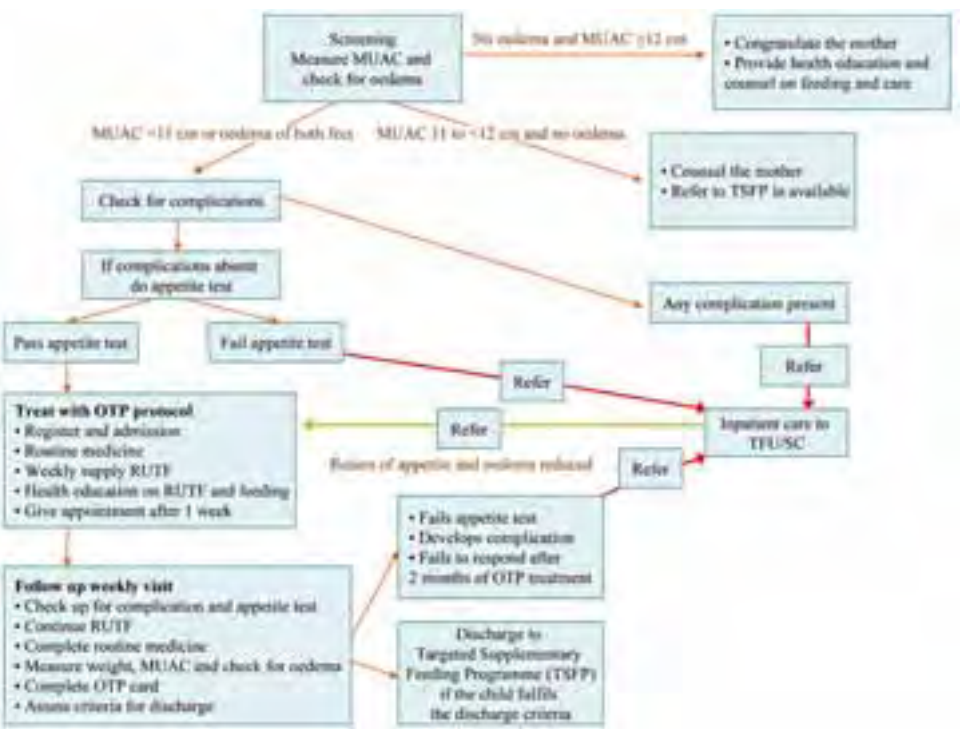


Figure 10.6 Key steps on managing severe acute malnutrition.

You can see from the flow chart the key steps that are necessary when managing severe uncomplicated malnutrition of a child during the different phases of treatment. The red arrows indicate referrals, while the green arrows indicate the children you had referred who have come back to you once their complication improves. The black arrows indicate the flow of treatment as the child progresses over the course of treatment.

Summary of Study Session 10

In Study Session 10 you learned that:

1 All infants under six months with SAM need to be treated in an in-patient facility.

2 The presence of medical complications, including general danger signs, or failing the appetite test means that a severely malnourished child should be classified as severe complicated malnutrition and referred to an in-patient facility.

3 Children of six months or older with severe uncomplicated malnutrition can be treated in an OTP at your health post.

4 There are admission, referral and discharge criteria to and from OTP.

5 The OTP protocol provides you with the key steps for managing children with severe acute malnutrition.

6 It is important to record information on the appropriate registration and recording forms.

7 There are different aspects for organising out-patient treatment of SAM, including community mobilisation and using formal communication channels to ensure your community are aware of the relevant services.

Self-Assessment Questions (SAQs) for Study Session 10

Now that you have completed this study session, you can assess how well you have achieved its Learning Outcomes by answering the questions below. Write your answers in your Study Diary and discuss them with your Tutor at the next Study Support Meeting. You can check your answers with the Notes on the Self-Assessment Questions at the end of this Module.

SAQ 10.1 (tests Learning Outcome 10.2)

Dawit's story

Dawit Alemu is a 36 months old boy who is brought to your health post with the complaint of swelling of both of his feet. When you press his feet, the skin does not return to normal for two seconds. You measure Dawit's MUAC (11.5cm), his weight (9 kg) and his height (86.5cm).

(a) How would you classify Dawit and why?
(b) What additional information do you need to be able to decide whether to refer Dawit to the health centre or hospital?

SAQ 10.2 (tests Learning Outcomes 10.1, 10.2 and 10.3)

(a) Explain the importance of the appetite test.
(b) When would you admit a child to an OTP and what procedures should you follow?
(c) What advice would you give to a mother or caregiver whose child is taking Plumpy'nut®?

SAQ 10.3 (tests Learning Outcomes 10.4 and 10.5)

(a) Explain the importance of the registration book and OTP card for the management of children in your community who have severe uncomplicated malnutrition.
(b) What indicators will you look for at follow up visits to a child with severe uncomplicated malnutrition who is being cared for at home?

SAQ 10.4 (tests Learning Outcomes 10.4 and 10.5)

When can a child with severe acute malnutrition be discharged from an in-patient facility and what advice would you give the parents or caregiver?

SAQ 10.5 (tests Learning Outcome 10.6)

What steps will you take to ensure that the OTPs you organise are well attended and run effectively?

Study Session 11 Nutrition Education and Counselling

Introduction

In the previous study sessions you learned about optimal infant and young child feeding, macro and micronutrient deficiencies of public health importance in Ethiopia, and nutritional requirements throughout the life cycle. In this study session you will be introduced in more detail to the different ways you can help people to improve their own nutrition and that of their family.

You will learn about *behaviour change communication* and *essential nutrition actions,* as well as useful ways of communicating information about these actions to people in your community. You will also learn about *growth monitoring* and the *triple A cycle*, which is a way of making sure that you can pass on your knowledge effectively to the people you are responsible for. You will also learn ways of counselling mothers on child feeding.

Learning Outcomes for Study Session 11

When you have studied this session, you should be able to:

11.1 Define and use correctly all of the key words printed in **bold**. (SAQs 1.1, 11.2 and 11.7)

11.2 Describe the differences between nutrition education and nutrition behaviour change communication (BCC). (SAQs 11.1, 11.2 and 11.7)

11.3 Identify the steps of behaviour change communication. (SAQs 11.1, 11.2, 11.3 and 11.4)

11.4 Explain the essential nutrition actions used in BCC. (SAQ 11.3)

11.5 List the critical health contact points for nutrition BCC. (SAQ 11.4)

11.6 Identify non-health contact points for nutrition BCC. (SAQs 11.5, 11.6 and 11.8)

11.7 List the GALIDRA steps in delivering nutrition counselling. (SAQ 11.6)

11.8 Explain the critical focus area of nutrition BCC in Ethiopia. (SAQ 11.9)

11.1 Behaviour change communication

In your practice as a Health Extension Practitioner, there are different communication strategies you can use to help the people in your community to be responsible for their health. Systematic behaviour change approaches are a really important way of improving the nutritional status of the women and young children who are under your care. Behaviour change communication (BCC) strategies are aimed at influencing the actions of families and communities. In addition to considering individual health beliefs and practices, BCC can promote nutritional improvements and address local traditions and household dynamics (conditions). Audiences are carefully **segmented** (grouped), and communications can be made using mass media and through community leaders and elders to achieve defined behavioural objectives.

Segmentation refers to targeting key messages to the relevant audience at the relevant time. This helps prevent information overload for people, by ensuring they are not given unnecessary information. For instance, during pregnancy, it is better to focus on maternal nutrition and breastfeeding rather than talking to the mother and family about complementary feeding, which can be discussed at a later stage.

- ■ What is message segmentation and why it is important?
- □ Segmentation refers to targeting key messages to the relevant audience at the right time. It's a way of ensuring that people get the information that is most relevant to them when they need it.

11.2 Stages of behaviour change

One of your tasks as a Health Extension Practitioner is to identify where change in a person's behaviour or habits could help to have a positive impact on their health or the health of their baby. For example, helping a person eat a more balanced and healthy diet.

Behaviour change communication is more than just education, it aims to change behaviour and practice.

There are eight stages in behaviour change that will help the people you are working with change from being an uninformed person to becoming someone who may even be able to teach or influence others about their behaviour. You are going to learn about this now, using exclusive breastfeeding behaviour as an example to illustrate the key points.

Step 1 *Pre-awareness* At this stage people are not even aware of the changes that they need to make. In order to help them become a person who has awareness, you need to give them *information*. Nutrition education would stop at this stage without making sure that the person being educated has changed their action, practice or behaviour. Before this stage the mother does not know about the importance of exclusive breastfeeding during the first six months.

Stage 2 *Awareness* At this stage, the person has heard about the need to change their behaviour, but needs extra help and *persuasion* to start to actually bring about the changes. At this stage the mother is aware about the need for exclusive breastfeeding during the first six months, but has not thought of doing it for her baby.

Stage 3 *Contemplation* This person is contemplating (thinking) about changing their behaviour, but *needs more information and continued support and persuasion* about the advantages and disadvantages of changing their behaviour. At this stage more information about the benefits of exclusive breastfeeding compared to other forms of feeding is needed, as well as support that shows you understand the mother's situation.

Stage 4 *Intention* At this stage the person has understood the advantages and disadvantages of changing their behaviour but is not sure how they can bring about the new behaviour for themselves. The person needs *encouragement* to overcome obstacles of how to do the new behaviour. For example, the mother may be worried about not being able to maintain exclusive breastfeeding when she is away for work, or for other individual or personal reasons. In this situation you could show her how she can express breastmilk so the baby can be fed when she is away.

Stage 5 *Trial* The person has tried the behaviour or action required, but has faced difficulties. For instance, the mother tried to exclusively breastfeed her baby, but she faced some difficulties. She now needs support in the form of praise and reinforcement of the benefits. Reinforcing the

ways of preventing the problem she faced during exclusive breastfeeding is also important. So she needs counselling to find the best ways of overcoming her problems. At this stage the mother may have inadequate breast milk output and think that her breast milk is not enough for the baby to feed on until six months old. Here, she needs to be assisted on proper positioning and attachment and be reassured about the capacity of the breastmilk to feed the baby for the first six months. Your skills in negotiating the different options the mother can use will be important at this stage.

Nutrition behaviour change communication is different from nutrition education in that BCC *needs at least three contacts to change behaviour.* Unlike nutrition education, which aims at increasing awareness or knowledge, BCC targets change of behaviour or practice. For example, if at this point the mother has not tried exclusive breastfeeding, there needs to be at least three contacts between you and the mother to change her behaviour and to help her progress from the awareness stage to the trial stage**.**

Behaviour change communication (BCC) is an ongoing process that requires effective communication to persuade, encourage and support change.

Stage 6 *Adoption* At this stage, the person is demonstrating the new behaviour. They now need discussion to reinforce their behaviour and sustain the change they have made. For example, the mother has now sustained exclusive breastfeeding. What she needs at this stage is *further discussion on the benefits* of exclusive feeding to reinforce the behaviour and make sure that she continues exclusive breastfeeding for a few weeks. You can help her with this, by encouraging and praising her and emphasising the importance of exclusive breastfeeding for her baby's health.

Stage 7 *Maintenance* The person's behaviour by this stage has changed and they understand the benefits of the change. Now they just need support if they face any difficulties. For example, the mother has changed her behaviour and is now used to exclusive breastfeeding and has understood its benefits. It has become part of her behaviour and she thinks that she will exclusively breastfeed when she has another baby. What she needs at this stage is *support* in overcoming any further difficulties.

Stage 8 *Telling others* The person has done the behaviour for a considerable length of time, it has become routine behaviour and now leads to the person convincing others about the benefits of their health related behaviour. For example, the mother is encouraging other mothers to exclusively breastfeed their babies and describing the benefits to the baby and mother. What the mother needs at this stage is *praise*.

- Why is knowledge not enough to change behaviour, action or practice?

- You have learned that knowledge alone only provides information. The BCC model indicates that you can only promote effective and sustained changes in the way a person does something if you have at least three contacts with a person, and spend time persuading, encouraging and supporting a person to change. This reinforces their behaviour and is more likely to lead to lasting change.

Figure 11.1 summarises the eight steps to behaviour change.

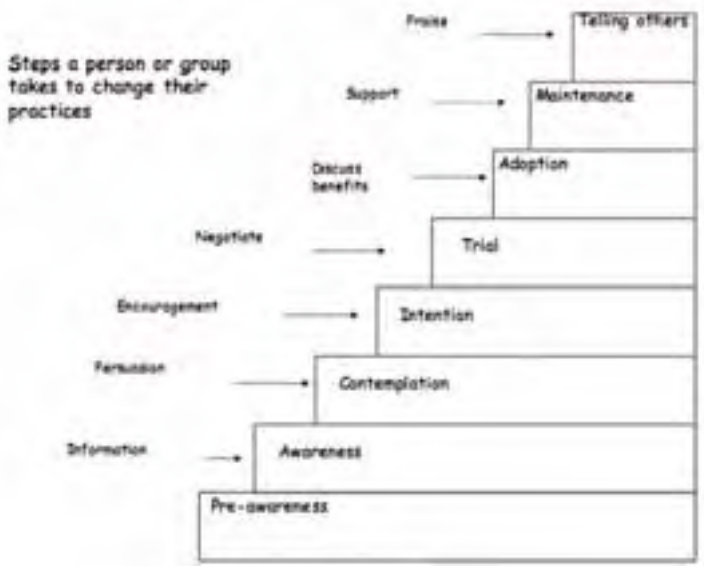


Figure 11.1 Stages of behaviour change. (Source: Linkages project/AED Ethiopia, 2005, *Behavioural change communication manual*)

You are now going to look at how you can use the BCC steps and apply these to a communication strategy to help improve nutrition in your community.

11.3 Nutrition behaviour change communication

Nutrition behaviour change communication is a strategy that you will be able to use to change nutrition related behaviours in your community. Using the techniques and approaches described in this study session you will be able to bring about practices that promote better health through optimal feeding practices and improved dietary habits. You will be able to use behaviour change communication (BCC) to teach people about essential nutrition actions, most particularly optimal infant and young child feeding practices and the key messages in relation to these, and also to facilitate the adoption of healthy adult dietary styles.

The BCC activity in your community will involve you educating the community about a wide range of activities including horticultural activities, development of backyard fruit and vegetable gardens, and use of irrigation and water harvesting systems. For such activities you will need to gain collaboration from the frontline agricultural workers in your community, as together you will have a greater impact. Table 11.1 summarises some of the actions you will probably need to do to facilitate the progress of behaviour change at each stage.

Of course the methods you are able to use in your work will depend on your own situation. As you read through the table you should think about the ways that you can bring about these stages of change in your own practice as a Health Extension Practitioner.

Table 11.1 Nutrition behaviour change communication strategies.

Stage of behaviour change	Action needed	Communication strategies
1. Pre-aware (never having heard about the behaviour)	Build awareness and provide information	Drama, songs Community groups Radio Individual counselling Young child feeding support groups
2. Aware (having heard about the new behaviour and knowing what it is)	Give more information, discuss benefits and persuade	Group discussions or talks Oral and printed word Counselling cards Feeding support groups
3 and 4. Contemplation and intention (thinking about new behaviour)	Persuasion and encouragement	Group discussions or talks Individual counselling Counselling cards Feeding support groups
5. Trial (trying new behaviour out)	Negotiate the best ways of overcoming obstacles	Home visits Use of visuals aids Groups of activities for family and the community Negotiate with the husband and mother-in-law (or influential family members) to support
6. Adoption (demonstrating the new behaviour)	Further discussion on the benefits to ensure the behaviour continues	Encouraging and praising Emphasising the importance of the behaviour
7. Maintenance (continuing to do new behaviour or maintaining it)	Discuss benefits, provide support at all levels	Congratulate mother and other family members as appropriate Suggest support groups to visit or join to provide encouragement Encourage community members to provide support
8. Telling others	Praise and reinforce the benefits and give support	Reinforce the benefits Praise

Nutrition BCC can be done with individuals or with groups or communities. To facilitate the progress of a person through each stage of behaviour change you can use the different actions and communication strategies that are summarised in Table 11.1. These are just possible examples however, and are by no means an exhaustive list of all the possible strategies. As a communicator, you will also be able to improvise (or adapt strategies) using locally available resources in your own community's context. The following activity will help you think how to put these stages into practice in different scenarios.

Activity 11.1 Behaviour change

Read the following case studies and then answer the two questions that follow.

A woman has heard the new breastfeeding information, and her husband and mother-in-law are also talking about it. She is thinking about trying exclusive breastfeeding because she thinks it will be best for her child.

A woman has brought her eight-month-old child to the baby weighing session. The child has lost weight and the mother asks the health worker for advice.

In the past month a health worker talked with a mother about gradually starting to feed her seven-month-old baby three times a day instead of just once a day. The mother started to give a meal and a snack and then added a third feed.

(a) What stage in the behaviour change model do you think each person has reached?

(b) What could the health worker do to help each of the women?

Answer

Case 1 The mother here is at the contemplation and intention stages. She is thinking about changing her behaviour. So the health worker can give her information and support (Stage 3). The mother has understood the benefits of exclusive breastfeeding but may not be sure how to do this. For example, she may be away for work and needs encouragement to overcome the obstacles to exclusive breastfeeding that this creates (Stage 4).

Case 2 In this case the mother does not know the cause of her child's weight loss and the health worker will need to explain that there could be a feeding problem. The mother is at Stage 1 (pre-awareness) and the health worker can provide the mother with information about an appropriate diet for her child and persuade (Stage 2) the mother of the advantages of the proposed diet for her child.

Case 3 In the third case the mother has implemented what the health worker told her at earlier visits and she has started feeding her child differently. This indicates that she is in the trial stage and moving towards adoption (Stage 5). The health worker can support the mother by providing additional encouragement and praising her.

11.3.1 The focus of community-based nutrition behaviour change communication

The focus of community-based nutrition (CBN) behaviour change communication in Ethiopia and throughout Africa is to facilitate feeding and dietary behaviours that are compatible with growth, development, long-term health, survival and productivity. Therefore your work will involve:

1 Promotion of essential nutrition actions

2 Promotion of food-based approaches to enhance the production and consumption of a wide range of nutritious foods.

A balanced and healthy diet is the key outcome.

The essential nutrition actions

Major emphasis is given to essential nutrition actions (ENA) in all national nutrition-related policies, strategies, programmes and guidelines including the National Nutrition Strategy (NNS), the National Nutrition Programme (NNP) and the National guidelines for control and prevention of micronutrient deficiencies. Table 11.2 summarises the seven ENAs and the key messages you will need to communicate to the target audiences in your community such as parents of young children. Take some time now to read the information set out in the table.

Table 11.2 Seven essential nutrition actions (ENA) and key messages. (Source: Linkages project/AED Ethiopia, 2005, *Behavioural change communication manual*)

ENA component	Key message
1 Optimal breastfeeding 	• Initiate breastfeeding within one hour after delivery • Exclusively breastfeed for the first six months • The mother breastfeeds frequently, day and night • Mother allows infant to breastfeed on demand (as often as the infant wants) every two to three hours (8–12 times per 24 hours) • Mother breastfeeds more frequently (or expresses her milk if the infant cannot breastfeed) • The mother positions and attaches infant correctly at the breast • The mother offers second breast after infant releases the first • The mother should eat more than usual (one additional meal)
2 Optimal complementary feeding	• At six months, mother or caregiver introduces soft, appropriate foods and continues breastfeeding on demand • The mother or caregiver increases the frequency of feedings and the amount of food, as the child gets older • Increase food thickness (density) and variety as the child gets older • Increase the amount of food as the child gets older • Good hygiene and safe food preparation • Active/responsive feeding

3 Sick child feeding	• Breastfeed more frequently (or express her milk if the infant cannot breastfeed) • Baby *older than six months*: the mother should also offer the baby bland food (even if the baby is not hungry) and increase the frequency of feeding
4 Maternal nutrition during pregnancy and lactation 	• Iron and folic acid supplementation • Treatment and prevention of malaria • Increase food intake • *One extra meal each day during pregnancy* • *Two extra meals each day during lactation* • De-worming during the third trimester of pregnancy • Vitamin A capsule within 45 days of delivery
5 Control of vitamin A deficiency 	• Breastfeeding • Vitamin A supplementation • Consumption of vitamin A rich foods (dark green leafy vegetables, yellow and orange fruits and vegetables) • Vitamin A supplementation a single dose every six months for all children six to 59 months and when the child comes with SAM, measles, acute respiratory infections, diarrhoea or vitamin A deficiency (see the study session on micronutrients). A single dose is given to lactating mothers within six weeks after delivery
Control of iron deficiency anaemia 	• De-worming of children aged two to 59 months every six months and pregnant women in the third trimester • Using bed nets • Diversifying diet consumption of foods from the six groups according the food guide pyramid • Cooking in iron pots (the iron from pots will get in to the food and supply the consumer with iron) • Iron supplementation to pregnant women AND children
Control of Iodine deficiency disorders 	• Consumption of iodised salt by the family

11.3.2 Integrating the seven ENAs into the six health contacts

You will have six health contacts with mothers and children in your community. Nutrition behaviour change communication and promoting the seven essential nutrition actions will be an important element within these six health contacts. Table 11.3 overleaf outlines what the six health contacts are, and the key nutrition action messages you need to communicate at each contact.

Table 11.3 Delivery of the key essential nutrition action messages. (Source: Linkages project/AED Ethiopia, 2005, *Behavioural change communication manual*)

The six Health contacts	Key essential nutrition actions messages to be communicated
1 Pregnancy 	• Consumption of at least one additional meal • Iron and folic acid supplementation • Iodized salt consumption by the family • Optimal infant feeding • Infant feeding options if the mother is HIV-positive • Use of impregnated bed nets • Deworming in the third trimester • Tetanus toxoid vaccination • Regular antenatal visits
2 Delivery 	• Safe delivery • Vitamin A (within six weeks after delivery) • Iron and folic acid supplement • Optimal infant feeding • Use of impregnated bed nets if the area has malaria • Consumption of at least two additional meals • Infant feeding options if the mother is HIV-positive
3 Postnatal and Family Planning 	• Iron and folic acid • Family planning • Consumption of at least two additional meals • Infant feeding options for HIV positive mother • Vaccination
4 Immunization 	• Deworming • Assessment an treatment of infant's anaemia • Use of impregnated bed nets if the area has malaria • Family planning
5 Well child and growth monitoring and promotion 	• Monitor growth • Counsel on infant feeding • Iodized salt • Vaccination • Use of impregnated bed nets if the area has malaria
6 Sick child visit 	• Monitor growth • Treat according to IMNCI guidelines • Counsel on sick child feeding • Check immunization is complete • Vitamin A • Deworming • Counsel infant feeding options if the mother is HIV-positive

■ When does breastfeeding appear as a key message within the seven ENAs a key message and why is it so important?

□ Breast feeding is included in four of the key messages, namely optimal breastfeeding, optimal complementary feeding, sick child feeding and control of vitamin A deficiency. You know from this and earlier study sessions that breastfeeding is critical for promoting healthy growth in infants, helping prevent disease and encourage bonding between the mother and baby.

Nutrition BCC on ENA components can also be given as part of other health programme contacts including child survival interventions (such as community IMNCI and community nutrition programmes), national immunization days and other infectious diseases control programmes.

11.3.3 Integrating the seven ENAs into other sectors

Nutrition improvement for the people you are responsible for cannot be addressed by any one sector alone; it needs to be integrated with frontline workers in other sectors. You will therefore need to communicate with the different frontline workers in sectors such as education and agriculture.

Table 11.4 summarises the ENAs that could be integrated to sectors outside health.

Table 11.4 Key nutrition messages that could be integrated with the activities of other sectors.

Other non-health contacts	**Key essential nutrition action aspects the BCC should focus on**
School	School lunch programme De-worming Adolescent nutrition Iron and folic acid supplementation Iodised salt consumption by the family Use of insecticide-treated bed nets Tetanus toxoid (TT) vaccination
Community nutrition	De-worming Adolescent nutrition Maternal nutrition Community growth monitoring and promotion Maternal nutrition during pregnancy and lactation
Emergency	General ration distribution Outpatient therapeutic programme (OTP) Therapeutic feeding programme (TFP) Targeted supplementary feeding and blanket supplementary feeding programmes Caring practices (optimal breastfeeding and optimal complementary feeding, preventive and promotive health seeking) Exemption of pregnant women and lactating mothers with a child under six months old from the public work requirement in the food-for-work programme (unconditional transfer)
Agriculture	Food diversification Food security
Water and sanitation	Building water points saves maternal workload and energy expenditure and gives more time for caring practices

Informal community gatherings (market days, 'Debo', 'Edir', 'Equb', Coffee Ceremony 'Mahiber', 'senbete')	Using these gatherings to do ENA BCC Consumption of at least one additional meal per day Iron and folic acid supplementation Iodised salt consumption by the family Optimal infant feeding Infant feeding options if the mother is HIV-positive Use of impregnated bed nets De-worming in the third trimester TT vaccination Regular antenatal visits

- How might you be able to work with other sectors in your own community or work situation to improve the nutritional status of people living in your community?

- Working with agricultural development workers or school teachers within your community will be an important part of your role. Working collaboratively will help to ensure the essential nutrition actions are shared as widely as possible and help to build understanding of their importance.

11.4 Nutrition behaviour change communication in food-based approaches

It is not possible to address nutritional problems in a sustainable way through supplementation in the form of tablets or capsules. It would be too difficult to organise and the costs would be too high. Therefore, promotion of food-based approaches are important for you to use within your own community. Horticultural activities and dietary diversification are both examples of important approaches, as you saw in Study Session 7, so BCC should focus on the need for consumption of different varieties of foods. The intensification of horticultural activities needs to be supported by nutrition education and one of the things you can do as Health Extension Practitioner is to provide practical demonstrations for people in your community and encourage women to cultivate vegetable gardens as a source of nutritious food for their families (see Figure 11.2).

In addition, BCC should focus on the importance of knowledgeable care for pregnant and lactating women, and for children during the first two years of life. This should give greater emphasis on changing behaviours in relation to:

- Cultural malpractice and beliefs in child feeding and weaning (complementary feeding process, exposure of children to sunlight, addressing issues relating to food faddism and food prejudices)
- Intra household mal-distribution of food (e.g. age bias, sex bias)
- Emotional deprivation and neglect of the child.

As Health Extension Practitioner you can help bring about positive dietary behaviour through effective nutrition BCC in your community.

11.5 Growth monitoring and promotion

Growth monitoring is a critical entry point for you for counselling the mother or the caregiver about the child's nutrition.

Growth monitoring refers to the regular assessment of the growth of children under two years old to detect deviation from normal growth and the application of appropriate interventions. During community-based nutrition (CBN) programmes you will have the opportunity to weigh children under two years old every month, and plot their weight on the chart. In the following section you will learn how you can counsel mothers and caregivers about the growth and nutritional status of their children.

11.5.1 Objectives of growth monitoring

Growth monitoring and promotion have the following objectives:

- To measure individual health and to instigate effective action in response to **growth faltering** (slowing down)
- Teach mothers, families and health workers how diet and illness can affect child growth and thereby stimulate individual initiative and improved nutrition and healthcare practices
- To provide regular contact with primary health services.

Poor linear growth (underweight and stunting) usually occurs in the first 24 months of life. If the child is not optimally fed during this time, they could lose 11cm from the potential height that they would have reached as an adult. Once stunting has happened, it is very difficult to catch up. By the time a child is two or three years old, catch-up growth is less likely to occur; such children have probably failed to grow and are potentially stunted for the rest of their lives. You learned how to assess whether a child is stunted in Study Session 4 of this Module.

Table 11.5 outlines the main reasons for malnutrition in children during their first five years.

Table 11.5 Determinants of child malnutrition during the first five years.

Age of malnourished child	Determinant factors
Birth	Maternal factors (including nutrition), gestational age
Four–six months	Infant feeding practices, maternal ability to care for the child
Six months to two years	Complementary feeding practices, exposure to infections, disease and poor household food as the child gets older
Two–five years	Inadequate access to household food; infections and social deprivation

In Ethiopia we use underweight for monitoring growth, as it indicates acute changes in the nutritional status of the child. If you determine that the child is malnourished (underweight), you should be able to analyse the causes, identify resources, suggest alternative solutions and arrive at decisions together with the mother or caregiver as to what should be done about the child. This process of assessment analysis and action is known as the 'triple A' cycle which is described below.

11.5.2 The 'Triple A' cycle approach

Growth monitoring can be undertaken using a cyclic process called **Triple A cycle**. As the term indicates, there are three stages to the process.

Assess

This stage involves weighing a child on a regular basis, and comparing the child's growth with the standard and with their previous weight. The measurements will determine the rate of the growth of the child. This helps to identify any nutritional problems and will help you reflect on and review the child's situation with the mother or caregiver.

Analyse

This requires exploration of any nutritional problem of the child in order to understand the root causes of any difficulties. You should identify gaps in feeding or care practices and think about different alternative solutions and resources that you can suggest to the mother or caregiver.

Action

This stage involves counselling the mother or caregiver about relevant actions. It involves decision making and resource identification as well as deciding on individual and collective doable actions. After thorough discussion with the mother or caregiver, you should be able to decide on the specific actions they need to do. Ideally these actions are feasible and can realistically be done by the caregiver and the household. Each time the child is weighed again, re-assessment is done, followed by new analysis and new action as necessary.

Figure 11.2 illustrates the triple A cycle.

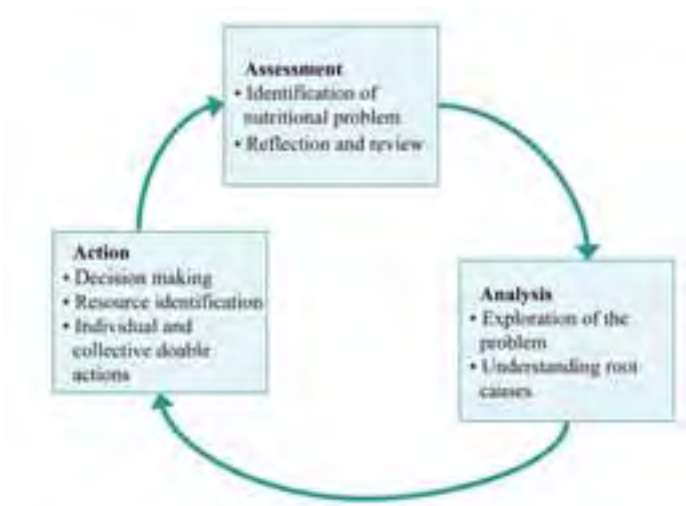


Figure 11.2 The triple A cycle.

The triple A cycle measures the direction of the child's growth.

The most important issue in growth monitoring is not the position of the child on the growth curve at one particular time, but the *direction of his or her growth*. Look at Figure 11.3 overleaf. A single point on the line of growth could be reached from different directions (that is, the child's weight could go down to the single point or could move up to that point on the chart). Normally the child's measurements are expected to fall between the lines indicated on the graph by –2 and +2 Z-scores (see the right hand side of the graph). The zero (or '0') score represents the standard average measurement.

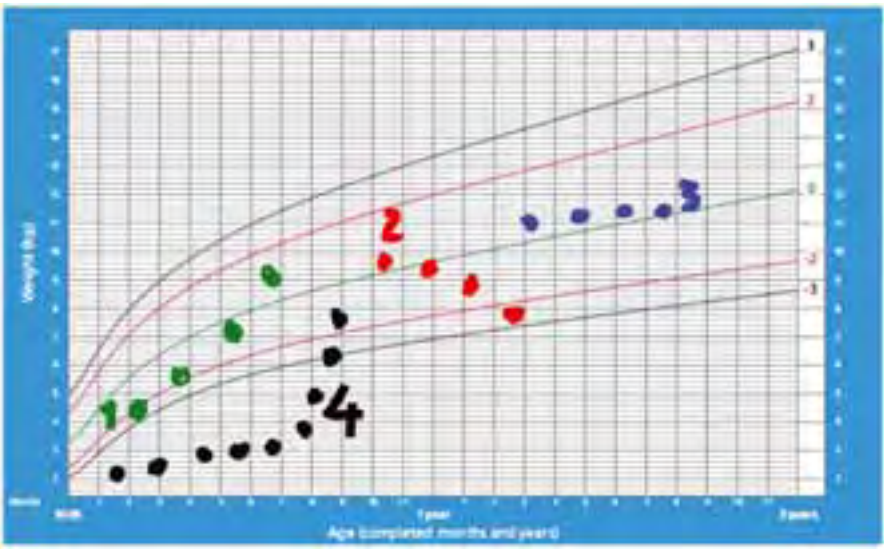


Figure 11.3 The direction of growth of the child.

Figure 11.3 plots the direction of growth of four children. It gives you information you need to be able to advise the mother and caregiver what they need to do for their child.

1 The child with the green plotted line is growing normally; you should encourage the mother to continue her feeding the way she has been doing it.

2 The child with the red plotted line is decreasing weight. There must be something wrong with the feeding. You need to counsel the mother about the optimal feeding practices.

3 The child with the blue plotted line is not growing, indicating that there is some problem with its feeding. You need to find out the problem together with the mother or caregiver and counsel them on what to do.

4 The child with black plotted line is on catch-up growth (fast growth) after a period of malnutrition. So you should encourage the mother to continue feeding the child in the way she has been doing.

■ Why are serial (repeated) measurements in growth monitoring needed?

□ You need to do repeat measurements to check the rate and direction of growth of the child. Knowing the rate and direction of growth will help you when you are counselling the mother or caregiver.

11.6 Counselling mothers and caregivers on child nutrition

In your work, you will have many possibilities for helping parents improve the nutritional status of their children. You should always employ nutrition counselling as a tool to help you achieve this objective. **Nutrition counselling** is a process of finding the solution to the child's nutritional problem together with their mother or caregiver. Unlike nutrition education, nutrition counselling is a two-way process during which the mother is actively involved in describing the child's problems as well as participating in analysing the causes and identifying the available resources and solutions.

Working together in this way with the mother or caregiver will help them reach a decision about the doable actions. Analysing causes and identifying

actions are an important part of the overall process. Once you weigh the child and determine their nutritional status you need to share this information with the mother and negotiate with her what actions she can take. Follow-up is also very important and you should always recommend to the mother that she makes an appointment so you can see whether she has carried the agreed actions or whether she has had some problems with these. This action or counselling stage completes the triple A cycle approach.

Counselling is an important skill, and as you have seen, a key element of the triple A cycle. The GALIDRA steps outlined in Box 11.1 will help you to counsel mothers and caregivers effectively.

Box 11.1 GALIDRA steps

The diagram below illustrates how the GALIDRA steps fit into the triple A cycle.

GALIDRA	
G	Greet the mother.
A	Ask her about her feeding practices of the child.
L	Listen to what the mothers says.
I	Identify the problem and resources.
D	Discuss the feeding difficulties she has and the cause of malnutrition in the child and decide on the alternative actions that the mother agrees to undertake.
R	Recommend the alternative doable solution.
A	Appoint her for reassessment.

Health Extension Practitioner counselling a mother

(Photo: UNICEF Ethiopia / Indrias Getachew)

Counselling using GALIDRA steps is an individually focused BCC strategy that enables you to bring about positive behavioural change. As you can see in Figure 11.4, the process involves you having repeated contact with a mother or caregiver to make sure that they get to the trial and adoption stages of behaviour change that you looked at in section 11.2 of this study session.

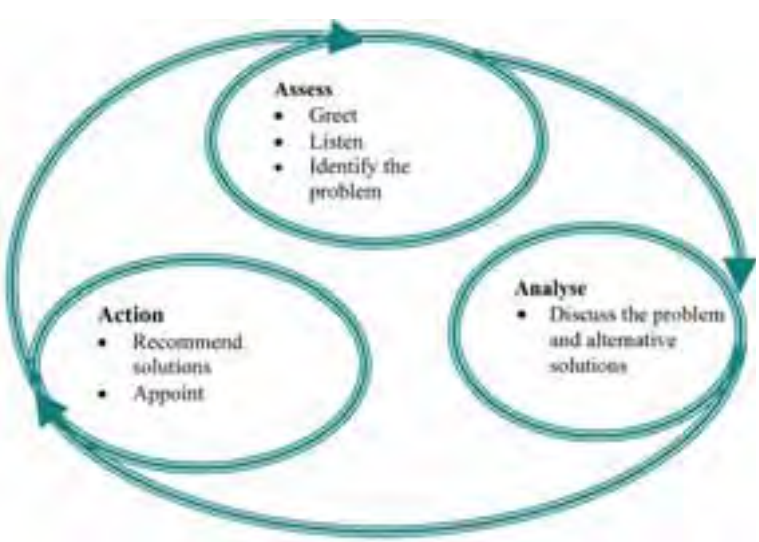


Figure 11.4 GALIDRA is a cyclic process.

Summary of Study Session 11

In Study Session 11 you have learned that:

1 Nutrition education aims at increasing awareness or knowledge. Knowledge is not sufficient because at least three contacts are needed to change behaviour or practice.

2 Nutrition behaviour change communication (BCC) is different from nutrition education as it aims to change behaviour or practice.

3 The focus of nutrition BCC is on the seven components of essential nutrition actions and their key messages. These messages are communicated at the six health contacts and through other contacts outside the health sector.

4 The second focus of nutrition BCC is food-based approaches, which includes the promotion of diversified production and diversified consumption of plant source and animal source foods.

5 Growth monitoring and promotion (GMP) is done for children in Ethiopia who are under two years old. The serial measurements in GMP are required for detecting the rate and direction of growth of the child so that appropriate intervention can be planned and delivered.

6 GALIDRA steps are used for delivering nutrition counselling and negotiation about child feeding with the mothers or caregivers.

Self-Assessment Questions (SAQs) for Study Session 11

Now that you have completed the study session, you can assess how well you have achieved its Learning Outcomes by answering these questions. Write your answers on your study diary and discuss them with your Tutor at the next study support meeting. You can check your answers with the Notes on the Self-Assessment Questions at the end of the module.

SAQ 11.1 (tests Learning Outcomes 11.1, 11.2 and 11.3)

(a) Write a list explaining the differences between nutrition education and nutrition behaviour change communication (BCC).

(b) Why is BCC important?

SAQ 11.2 (tests Learning Outcomes 11.1, 11.2 and 11.3)

Match the stage of behaviour change in Table 11.6 with the actions needed to facilitate the change to the next stage.

Table 11.6 for SAQ 11.2.

Stage of behaviour change	Action needed
1. Pre-aware	a. Discuss benefits and provide support at all levels
2. Aware	b. Encourage/discuss benefits
3 Contemplation/intension	c. Build awareness/provide information
4. Trial	d. Praise/reinforce the benefits
5. Maintenance	e. Negotiate and help to overcome obstacles
6. Telling others	f. Persuade/give more information

SAQ 11.3 (tests Learning Outcomes 11.3 and 11.4)

Explain the key messages of essential nutrition actions to be used in the BCC for preventing vitamin A deficiency.

SAQ 11.4 (tests Learning Outcomes 11.3 and 11.5)

Why are the critical health contact points for nutrition BCC important? Think of two or more reasons.

SAQ 11.5 (tests Learning Outcome 11.6)

What non-health contact points with the mothers could be used for nutrition BCC?

SAQ 11.6 (tests Learning Outcomes 11.6 and 11.7)

(a) What are the steps in delivering nutrition counselling?
(b) Why is nutrition counselling important?

SAQ 11.7 (tests Learning Outcomes 11.1 and 11.2)

What is the triple A cycle and when might you use it?

SAQ 11.8 (tests Learning Outcome 11.6)

What informal community gatherings can be used for ENA BCC?

SAQ 11.9 (tests Learning Outcome 11.8)

What are the critical focuses of the nutrition BCC in Ethiopia?

Study Session 12 Nutrition and HIV

Introduction

Your work as a Health Extension Practitioner will often bring you into contact with people who have HIV. These people will be suffering from malnutrition and undernourishment. There is a close relationship between HIV, malnutrition and other infections. This is because HIV compromises nutritional status, and poor nutrition further weakens the immune system, increasing susceptibility to opportunistic infections.

People living with HIV/AIDS (PLHIV), especially children who also have a degree of malnutrition, are at high risk of opportunistic infections and early death. Even mild and moderate malnutrition increases the risk of death. Identifying and addressing malnutrition in people who have become HIV-infected can help them heal faster from infection, strengthen their immunity, and possibly slow the progression to AIDS. Depending on the degree of malnutrition, nutrition care can be given at home or at the out-patient or in-patient level. Thorough nutrition assessment is needed to manage nutrition problems effectively.

Learning Outcomes for Study Session 12

When you have studied this session, you should be able to:

12.1 Define and use correctly all of the key words printed in **bold**. (SAQs 12.1, 12.2, 12.3 and 12.4)

12.2 Explain the relationship between nutrition and HIV. (SAQ 12.1)

12.3 List the effects of good nutrition on HIV. (SAQ 12.2)

12.4 List the seven ways in which PLHIV are able to maintain their strength and health. (SAQ 12.2)

12.5 Describe feeding options for an infant born to an HIV-positive mother. (SAQ 12.3)

12.6 Explain the benefits and risks of each of the feeding options for an infant born to an HIV-positive mother. (SAQ 12.3)

12.7 Explain the strategies that can be used to decrease transmission of HIV to an infant after birth. (SAQ 12.4)

12.1 Nutrition and infection

Before learning in more detail about the relationship between nutrition and HIV it is important to understand the relationship between nutrition and infection in general. Poor nutrition increases the body's vulnerability to infections, and infections in their turn make poor nutrition even worse. Inadequate dietary intake lowers immune system functioning and reduces the body's ability to fight infections. Poor nutrition is therefore likely to increase the incidence, severity and length of infections. Symptoms that accompany infections such as loss of appetite, diarrhoea and fever lead to further reduced food intake, poor nutrient absorption, nutrient loss and altered metabolism. All of these contribute to weight loss and growth faltering, which in turn further weaken the immune system.

An adequate balanced diet, proper hygiene, food safety and nutritional management of symptoms are critical interventions to break the cycle of infection and malnutrition.

12.2 HIV and nutrition

HIV infection progressively destroys the immune system, leading to recurrent opportunist infections (OIs), debilitation and death. OIs are infections that take advantage of a weak immune system. Poor nutritional status is one of the major complications of HIV and a significant factor that might lead people to develop full-blown AIDS. In places where there are inadequate food supplies (resource-limited settings), many people who become infected with HIV may already be undernourished. Their weakened immune systems further increase their vulnerability to infection.

12.2.1 Poor nutrition and HIV: a vicious cycle

In this section you are going to look at the damaging cycle that can lead to a person with HIV and under-nutrition developing a variety of health problems including weakness, weight loss and loss of muscle tissue and fat. This cycle is represented in Figure 12.1. Vitamin and mineral deficiencies may occur at a time when a person actually has increased nutritional needs because of infections, viral replication and poor nutrient absorption. The whole body develops reduced immune functioning and increased susceptibility to opportunistic infections.

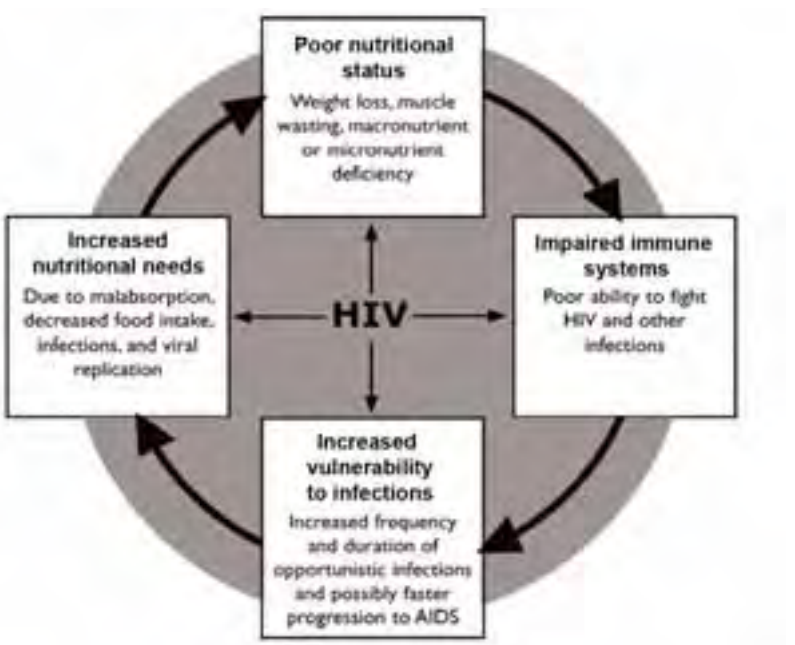


Figure 12.1 Vicious cycle of malnutrition and HIV. (Source: Federal Ministry of Health, 2008, *Ethiopian Guide to Clinical Nutrition Care for Children and Adults with HIV*)

As you can see from Figure 12.1, the relationship between HIV and nutrition is multidirectional. HIV can cause or worsen undernutrition by making the person feel poorly and want to reduce their food intake at the same time as their body has increased energy requirements in an attempt to fight the infection. The disease itself may make the absorption of energy and other nutrients less efficient. Undernutrition in turn further weakens the immune

system, increasing the risk of infection and worsening the disease's impact. Box 12.1 summarises these points.

Box 12.1 The effects of under-nutrition on HIV

If a person living with HIV infection is under-nourished, they will have a weakened immune system that may lead to increased susceptibility to opportunistic infections. The person may also have a slow rate of healing from illnesses, possibly fast progression of the HIV disease state, and response to treatment may be poor.

12.2.2 Breaking the cycle of HIV and undernutrition

Improving and maintaining good nutrition may prolong health and delay the progression of HIV to AIDS. Because the impact of proper nutrition begins early in the course of HIV infection, even before other symptoms are observed, as a Health Extension Practitioner you will have an opportunity to make a real impact on the lives of people living with HIV (PLHIV).

Nutrition care and support helps PLHIV maintain and improve their nutritional status, improve their immune response, manage the frequency and severity of symptoms, and improve their response to antiretroviral therapy (ART) and other medical treatment. Figure 12.2 illustrates how the cycle between HIV and malnutrition can be broken using different interventions.

Figure 12.2 Nutrition and HIV: The cycle of benefits from nutrition interventions. (Source: Federal Ministry of Health, 2008, *Ethiopian Guide to Clinical Nutrition Care for Children and Adults with HIV*)

■ Have a close look at Figure 12.2. Can you tell from this figure how the vicious cycle between HIV and poor nutrition can be reversed?

□ Figure 12.2 illustrates how effective nutrition interventions such as an increased and varied diet with food from different food groups, can help transform the cycle of HIV and undernutrition into a positive relationship between improved nutritional status and stronger immune response, which will reduce vulnerability to infections.

12.2.3 The effects of HIV on nutrition

People living with HIV infection have a higher chance of developing undernutrition than those who are not infected. HIV affects the nutritional status of these people in different ways. The effects of HIV may occur at different times during the course of their illness.

The following are typical adverse effects of HIV infection which may affect the person's nutritional status:

- Reducing food consumption because of appetite loss or anorexia
- Nausea
- Oral thrush
- Constipation
- Bloating or heartburn.

People with HIV also tend to have various oral conditions that can make it difficult for them to eat. Impact on nutritional status includes:

- Impaired nutrient absorption
- Increased energy needs because of fever
- Possible increase in the need for other nutrients because of symptoms such as anaemia
- HIV-associated wasting
- Changing body composition.

12.3 Nutritional care of people living with HIV

As a Health Extension Worker, you are expected to give care to PLHIV. Nutritional care is one of the most important ways that you can look after someone who has an HIV infection and help them to maintain their health. You will be able to give nutritional care both at health post level and during home-based care. You learned the procedures for assessing the nutritional status of PLHIV in Study Session 5 and how to manage the nutritional problems you identified in Study Session 9. You are now going to learn about the types of care that you can provide to a PLHIV.

12.3.1 Nutritional care of HIV-positive adults and adolescents

Your work in the community will almost certainly bring you into contact with people living with HIV. This gives you the opportunity to help them maintain their health for as long as possible. For this reason you should make sure that they are weighed on a regular basis. You may have to speak to them in detail about the need for them to attend for weighing on a regular basis; you can

explain that it will enable you to monitor their health and provide them with good advice.

- Why do you think it is important for people living with HIV to be weighed periodically?

- It is important to weigh people regularly because weight loss is a sign of disease progression. If you see that a person is losing weight, you can suggest ways of increasing their nutrition intake so they do not have nutrition deficiencies which can lead to a weak immune system.

Look carefully at the series of pictures in Figure 12.3. These show seven ways that you could recommend to PLHIV how to maintain their strength.

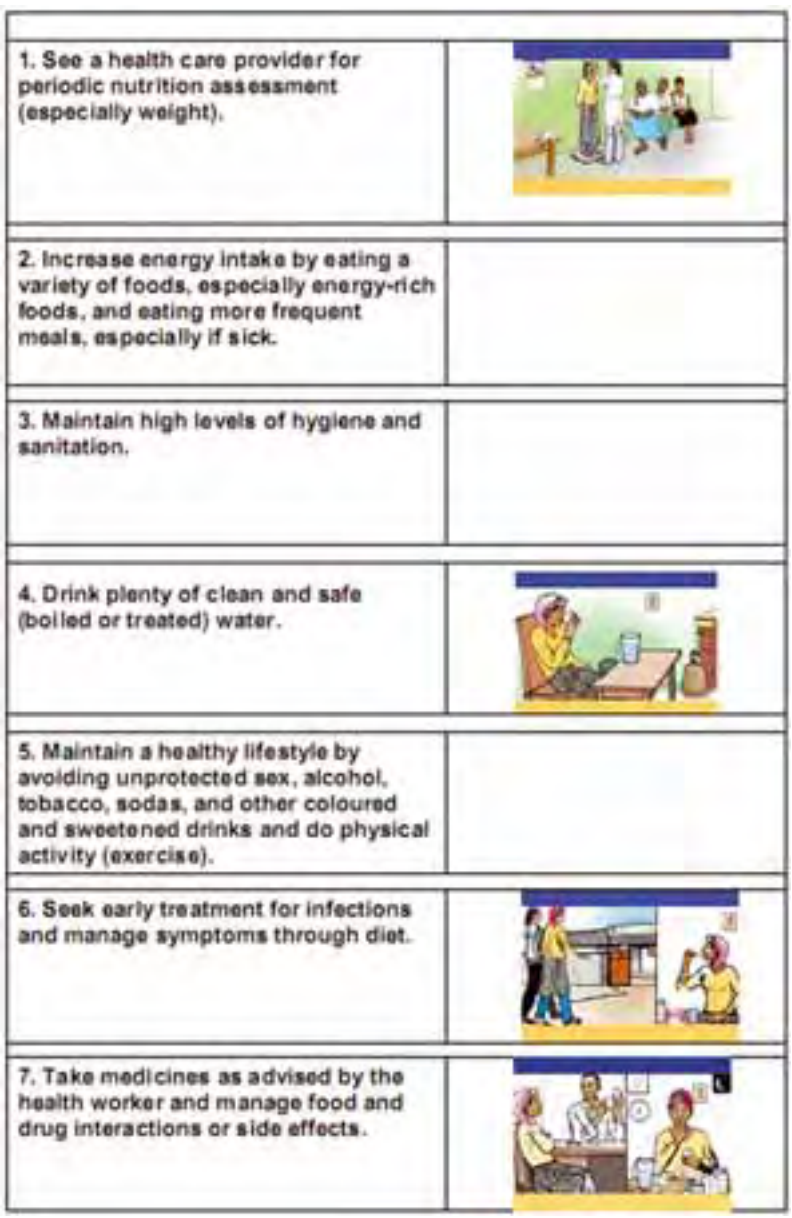


Figure 12.3 Seven ways PLHIV can maintain their strength. (Federal Ministry of Health, 2008, *Ethiopian Guide to Clinical Nutrition Care for Children and Adults with HIV*).

In addition to these seven activities, people living with HIV might require micronutrient supplementation. Sometimes the use of traditional therapies to boost nutrition and maintain strength is also really important.

- How would you encourage PLHIV to adopt these seven activities?

  - You could talk to them about the importance of eating enough healthy food to ensure their immune system stays as strong as possible, so they are not vulnerable to infection and can try to slow the progression to AIDS.

- What diet would you recommend to someone in your community who is living with HIV?

  - The best and recommended source of good nutrition is a variety of foods, including fruits and vegetables, grains, and animal products.

12.3.2 Nutritional care of HIV-positive pregnant and lactating women

A woman's nutritional status during pregnancy influences the risk of maternal to child transmission of HIV (MTCT) as well as their pregnancy outcomes (see Figure 12.4). A mother can transmit HIV to her infant during pregnancy and delivery or through breastfeeding, but most infants of HIV-positive mothers do not become infected. In deliveries where no interventions are used to reduce transmission, about 5–10% of infants are infected during pregnancy, 10–20% during labour and delivery, and 5–20% during breastfeeding if the child is breastfed.

Most infants who are exclusively breastfed by HIV-positive mothers do not become infected with HIV.

Figure 12.4 A mother's nutritional status is also important for her infant. (Photo: UNICEF Ethiopia / Indrias Getachew)

Working in the community you should have the opportunity to look after women who have HIV during their pregnancies. In order to give them and their new babies optimal care you should follow the same procedure you learnt in Study Session 5 for assessing the nutritional status of HIV-positive pregnant and lactating women. You should also counsel them on the seven ways to maintain their strength that you have just learnt about.

You will be able to stress to the women the importance of them attending ANC services, delivering in a health facility, and follow-up care to reduce the possibility of transmitting HIV to their babies.

12.4 Feeding babies and children born from women who are HIV-positive

Appropriate feeding practices are essential for optimal growth, development and the survival of infants and children. Breastfeeding plays a key role in optimally supplying all the nutrients and energy needs of infants in the first six months of life. Between six and twelve, breastmilk contributes to 50% of the infant's energy requirement and remains an important source of vitamins and minerals. On the other hand for up to 40% of babies with HIV, the infection came from postnatal transmission of HIV through breastfeeding. However in resource constrained countries, replacement feeding actually causes equal or more infant deaths due to malnutrition and infection when compared to the number of deaths due to HIV as a result of postnatal transmission through breastfeeding.

Understanding the relationship of breastfeeding and child survival is a key to successful counselling of HIV positive mothers on how to optimally feed their babies. This section addresses important issues with regard to infant feeding in the context of HIV in Ethiopia. The *IMNCI* Module also looks at how to assess and support children living with HIV/AIDS.

12.4.1 Breastfeeding and HIV

Breastfeeding accounts for 30–40% of mother to child transmission in populations where breastfeeding is practised until the child is two years of age. However, replacement feeding, if not carried out properly, is associated with increased risk of morbidity and mortality at a young age. This is particularly the case in low-resource settings.

Exclusive breastfeeding during the first six months of life is associated with lower transmission of HIV and improved child survival compared to non-exclusive breastfeeding children in developing countries.

There are a number of common terms used to describe infant feeding practices. You may already be familiar with these terms. Box 12.2 summarises what each one means.

Box 12.2 Common terms used in infant feeding options

- **Exclusive breastfeeding**: Giving only breastmilk and no other drinks or foods, not even water, with the exception of drops or syrups consisting of vitamins, mineral supplements or medicine.
- **Exclusive replacement feeding**: The use of breastmilk substitute totally avoiding breastmilk.
- **Mixed feeding**: Giving breastmilk with non-human milk and solids and other fluids.
- **Complementary feeding**: Addition of semi-solid or solid food in addition to breastmilk or formula at six months.

Mothers who are able to give exclusive replacement feeding can usually do this successfully if a number of factors are in place. These are known as the AFASS factors, and we have summarised these in Box 12.3.

Box 12.3 AFASS components

Acceptable: The mother has no barrier in choosing a feeding option for cultural or social reasons, or for fear of stigma and discrimination

Feasible: The mother (or family) has adequate time, knowledge, skills, and other resources to prepare feeds and to feed her infant, and the support to cope with any family, community and social pressure

Affordable: The mother and family, with available community and/or health system support, can pay for the costs of the feeding option, including all ingredients, fuel and clean water, without compromising the family's health and nutrition spending. The current estimate for formula (without including fuel, water, mother's time, etc.) for a child on exclusive replacement feeding is about 1200 to 1500 Eth. Birr per month

Sustainable: The mother has access to the continuous and uninterrupted supply of all ingredients and commodities needed to implement the feeding option safely for as long as the infant needs it.

Safe: Replacement foods are correctly and hygienically prepared and stored in nutritionally adequate quantities; infants are fed with clean hands using clean cups.

- Why do you think that exclusive replacement feeding might be difficult for some mothers in your community?

- Exclusive replacement feeding is difficult, especially in rural situations because it is expensive for families on low incomes and because preparing formula milk in consistently hygienic conditions is almost impossible.

12.4.2 Counselling mothers who are HIV-positive

One of the routes of HIV transmission from mother to child is through breastfeeding. Therefore it's very important to counsel a mother who is HIV-positive on feeding options to her infant (see Figure 12.5). In this section we will discuss how you can help mothers decide the preferred feeding options for her child.

Figure 12.5 A health worker counselling a mother on feeding options for her infant. (Source: Federal Ministry of Health, December 2007, *Integrated Management of Newborn & Childhood Illnesses (IMNCI)* Module, Module 2)

If an HIV-positive mother comes to you for counselling on how to feed her infant, how will you counsel her? Exclusive breastfeeding? Exclusive replacement feeding? Or mixed feeding? You may have to help her choose between two 'evils'. It's a difficult choice. First, as you have learnt, breastmilk is very important for the survival of the child. The difficult thing in recommending continuing breastfeeding is that HIV infection is present in breastmilk. So when you advise the mother to continue with exclusive breastfeeding, she needs to know she is possibly exposing the child to HIV infection.

If, on the other hand, you advise the mother on exclusive replacement feeding, the positive thing is that there will be no exposure of the child to the HIV virus. So the child will probably remain HIV-free. The difficult thing with this option is that not giving a child breastmilk, but relying on infant formula, is

associated with a high rate of morbidity and mortality. The high risk of malnutrition and diarrhoeal diseases are very common in children who are not breastfed, especially in resource-limited countries.

12.4.3 Possible feeding options for an infant born to an HIV-positive mother

For you to be able to advise an HIV-positive mother you need to be able to advise them of the risks involved in each feeding option, and explain why exclusive breastfeeding for six months is the recommended option in Ethiopia.

Mixed feeding

Studies have shown that mixed feeding carries both a risk of HIV transmission from mother to child and a high risk of malnutrition. Therefore you must counsel parents to avoid mixed feeding and continue either with exclusive breastfeeding or exclusive replacement feeding.

Exclusive replacement feeding

The use of exclusive replacement feeding (using commercial infant formula) eliminates the transmission of HIV from breastfeeding. Exclusive replacement feeding means that the mother completely avoids breastfeeding her baby. However, as you read earlier, there are risks as well as benefits associated with exclusive replacement feeding. These are set out in Box 12.4.

Box 12.4 Exclusive replacement feeding

Risks

- Increased risk of serious diarrhoeal infections and malnutrition leading to higher rates of early death
- Inadequate supply of formula leading to mixed feeding, increasing the risk of MTCT
- Formula feed is often diluted, improperly mixed, given inconsistently or prepared with unclean water
- There is an absence of protective factors in formula.

Benefits

- Less likelihood of HIV transmission from mother to child if entirely exclusive replacement feeding.

Because of the difficulties of exclusive replacement feeding, avoidance of breastfeeding is not safe in countries with limited resources like Ethiopia.

Exclusive breastfeeding

Several studies have demonstrated that babies who are exclusively breastfed are at a lower risk of acquiring HIV infection compared with infants who have mixed feeding. However, there are risks associated with exclusive breastfeeding.

HIV is present in the breastmilk of infected mothers and can be transmitted to infants by breastfeeding. This poses a substantial risk for acquisition of HIV infection for the infant. Women with advanced disease are at highest risk of

transmitting the virus to their babies during breastfeeding. Prolonged breastfeeding (e.g. up to the age of 24 months) can increase the overall risk of mother-to-child transmission.

12.5 National feeding recommendations for an infant born to an HIV-positive mother

There is a growing body of evidence with regard to infant feeding choices in the context of HIV and the impact on HIV-free child survival. For this reason, and following the technical review by the national paediatric HIV/AIDS care and the treatment technical working group, the FMOH has made recommendations with regard to infant feeding and HIV. It's important that as a Health Extension Practitioner, you are aware of these recommendations, which are set out below.

12.5.1 Infant feeding during the first six months of life

- The first and preferred infant feeding option in Ethiopia is exclusive breastfeeding for the first six months of life (see Figure 12.9). Stopping breastfeeding earlier than this should be avoided since this is associated with increased risk of death from diarrheal illnesses, malnutrition and pneumonia.
- Exclusive replacement feeding (formula feeding) is the second possible option for a minority of mothers. If this is the option chosen by a mother you have to make every effort to ensure that she does this safely. Some mothers may choose this option first but because of economic problems or cultural influences, they may end up mixing the formula with breastmilk, which will increase the risk of transmission.

Figure 12.6 A healthy breastfed child. (Photo: UNICEF Ethiopia / Indrias Getachew)

As a Health Extension Practitioner you should try to support mothers to decide on the first option. If this is not chosen, you should do your best to ensure safety before you agree with a mother that she uses the exclusive replacement feeding option. Only very few mothers could make it safe.

If a mother is using replacement feeding, infant formula is preferred for the first six months of life. Home-modified animal milk if used should be a temporary measure, and given for short periods only.

12.5.2 Feeding infants and children from six–24 months of age

At six months of age all infants need complementary food in order to sustain normal growth and development. Appropriate complementary foods should be introduced at six months of age with continued breastfeeding. Breastfeeding should stop only when a nutritionally adequate diet without breastmilk can be provided. This is usually around 12 to 18 months of age.

12.6 Strategies to decrease transmission of HIV during breastfeeding

Infants who are confirmed to be HIV-infected should continue to breastfeed according to recommendations for the general population.

You have learned that the preferred infant feeding option in the context of maternal HIV is to support mothers to breastfeed exclusively for the first six months. Every effort should be made to decrease the chance of transmission of HIV from the mother to the child.

The following list shows some of the strategies that may help to decrease the possibility of transmission:

- Expand ANC services and universal access to antenatal prevention of mother-to-child transmission (PMCT) services
- Actively support exclusive breastfeeding from birth until six months
- Advise parents not to mix feeds, advise them never offer other liquids, milks or foods in addition to breastmilk in the first six months, as this irritates the baby's gut and may lead to a higher rate of virus transmission to the infant
- Promote good health and nutrition of the mother
- Advise mothers to maintain good breast health and seek immediate attention for cracked nipples, mastitis or abscesses
- Support mothers to avoid becoming infected with HIV during breastfeeding (counsel on safe sex)
- Promote and support the initiation of complementary feeding at six months and to continue breastfeeding until the child is 12–18 months.

As a Health Extension Practitioner you have an important role in these strategies. You can use your knowledge and your skills in counselling to advise mothers (and families) on the best feeding options for infants born to HIV-positive mothers in order to optimise the health and development of the infant.

Summary of Study Session 12

In Study Session 12 you have learned that

1 If a patient with HIV infection is under-nourished they will have a weakened immune system that may lead to increased susceptibility to opportunistic illnesses, and slow the rate of healing from illnesses.

2 A weak immune system can hasten the progression of HIV and may impact on a patient's ability to respond to treatment.

3 Improving and maintaining good nutrition may prolong health and delay the progression of HIV to AIDS. The impact of proper nutrition begins early in the course of HIV infection, even before other symptoms are observed.

4 The preferred infant feeding option in Ethiopia is exclusive breastfeeding for the first six months of life. Stopping of breastfeeding earlier than this should be avoided since this is associated with increased risk of death from diarrhoeal illnesses, malnutrition and pneumonia.

5 Exclusive replacement feeding has a lower chance of MTCT of HIV, but in resource limited countries like Ethiopia, the cost of the formula is high and preparing it safely and consistently is very difficult. Poorly prepared and diluted milk stands a high chance of leading to infections and malnutrition.

6 Mixed feeding (giving both breastmilk and formula) to an infant born to an HIV positive mother increases the chance of MTCT and should be avoided.

7 Infants who are confirmed to be HIV-infected should continue to breastfeed according to Ethiopian recommendations.

Self-Assessment Questions (SAQs) For Study Session 12

Now that you have completed this study session, you can assess how well you have achieved its Learning Outcomes by answering these questions. Write your answers in your Study Diary and discuss them with your Tutor at the next Study Support Meeting. You can check your answers with the Notes on the Self-Assessment Questions at the end of this module.

SAQ 12.1 (tests Learning Outcomes 12.1 and 12.2)

What do you think are the main effects of HIV on nutritional status?

SAQ 12.2 (tests Learning Outcomes 12.1, 12.3 and 12.4)

(a) Discuss the most important effects of good nutrition to PLHIV.

(b) What advice would you give to a PLHIV so they can maintain their health and strength for as long as possible?

SAQ 12.3 (tests Learning Outcomes 12.1, 12.5 and 12.6)

(a) What is the recommended infant feeding option to an infant born to an HIV-positive mother?

(b) What is the reason that this option is preferred?

SAQ 12.4 (tests Learning Outcomes 12.1 and 12.7)

Discuss the important measures that you could adopt in your community to decrease MTCT of HIV for an infant who is breastfeeding and who has been born to an HIV-positive mother.

Session 13 Nutrition Information System

Introduction

In the previous study sessions you learned about the different methods of assessing nutritional status as well as determining indicators for malnutrition, micronutrient deficiencies of public health importance in Ethiopia and food security issues. In this study session, you will be introduced to the nutrition information system (NIS) and sources of data that can be used to generate useful nutritional indicators. You will also learn about the service generated data sources and the key nutritional indicators that can be calculated at local level and at national level. Much of this data will be generated by the routine community-based nutrition interventions that you are participating in as a Health Extension Practitioner.

Learning Outcomes for Study Session 13

When you have studied this session, you should be able to:

13.1 Define and use correctly all of the key words printed in **bold**. (SAQ 13.2)

13.2 List key indicators for the nutrition information system. (SAQ 13.2)

13.3 Explain why nutrition information needs to be reported regularly and promptly in Ethiopia. (SAQs 13.1 and 13.2)

13.4 Identify routine data sources and the types of indicators that can be obtained from each data source. (SAQs 13.3 and 13.4)

13.5 List the type of data you need to record and report regularly to generate these indicators at local and national level. (SAQs 13.3, 13.4 and 13.5)

13.1 Nutrition information system (NIS)

As a Health Extension Practitioner, you deliver a range of services to the community and record your activities for the purpose of reporting. These routine service records can be used to generate important data for the nutrition information system (NIS). This is a system of continuous collection, analysis and interpretation of nutrition-related data for making timely and effective decisions to improve the nutritional health of the population. Any good NIS will consist of the following features:

- The ability to detect and prevent malnutrition epidemics during times of insecurity
- The ability to collect and process information easily so that information can be available promptly to various levels of government administration and the local community for making policy decisions and developing intervention programmes
- As far as possible, it uses data and information already available from the routine service returns at the local level
- It is designed so that the information can be collected and processed by frontline health workers (such as Health Extension Practitioners) in the community
- It serves as a monitoring mechanism for higher level government administrators (regional and federal levels) so that information can be

communicated to them timely way without creating additional reporting arrangements.

The NIS facilitates prompt action and should be able to show **trends** (situations over a period of time) in nutrition in the country. The NIS has to function as a timely warning and intervention system (TWIS) and a system for linking problem-prone areas (community, *woreda*, regional and federal levels), with higher authorities at *woreda* and federal levels. It should also provide indicators that can serve as early detection mechanisms together with data of food crises from other sectors. Finally, an effective NIS should guide prompt action to cope with deterioration of the nutritional status of vulnerable people in the population, particularly among poor households, as well as children and mothers.

Generating relevant data is an important part of your role and helps to signal possible food shortages or the determination of the nutrition status of people in your community.

The NIS is aimed primarily at using data generated by the different programmes to help the decision-making process for mobilising resources in a targeted and appropriate way. As a frontline health worker, you can make use of the data generated by the system, together with other early warning signs diagnosed by the agricultural and other relevant sectors on food shortages or problems, in order to hasten timely interventions at all levels. The data you generate in your work (for example, the weight of infants in your community) is part of the overall information system and therefore has vital importance in helping to address nutrition problems and protect the people you work with in your community.

As a Health Extension Practitioner, you're the one at the community level to have first-hand information indicating people's wellbeing. If you use data effectively you can communicate information about a problem as fast as possible to the next level above you which in turn can forward crucial information to the highest decision-making level. Authorities at the Federal Ministry of Health use the information to monitor nutrition problems both at local and national levels. You should pass data onto the level above your health post as quickly as possible to enable effective decision making. Information is power, and having the right kind of information available at the right time enables the authorities to make effective decisions about how to address the nutritional needs of communities.

Data on different forms of malnutrition is essential to track the trends and variation of the nutritional status of a vulnerable population over time. It helps in assessment of the impact of the community-based nutrition interventions and progress towards achievement of the Millennium Development Goals. Data can be presented in different ways and draw attention to key messages. For example, look at Figure 13.1, which shows you the prevalence of chronic malnutrition (stunting) in African countries. You can see from the data that the prevalence in Ethiopia is among the highest.

Pause for a moment and think about your experience of using data generated by the routine services you are running. How have you used the data that you are generating, for example from therapeutic feeding programmes or child health days?

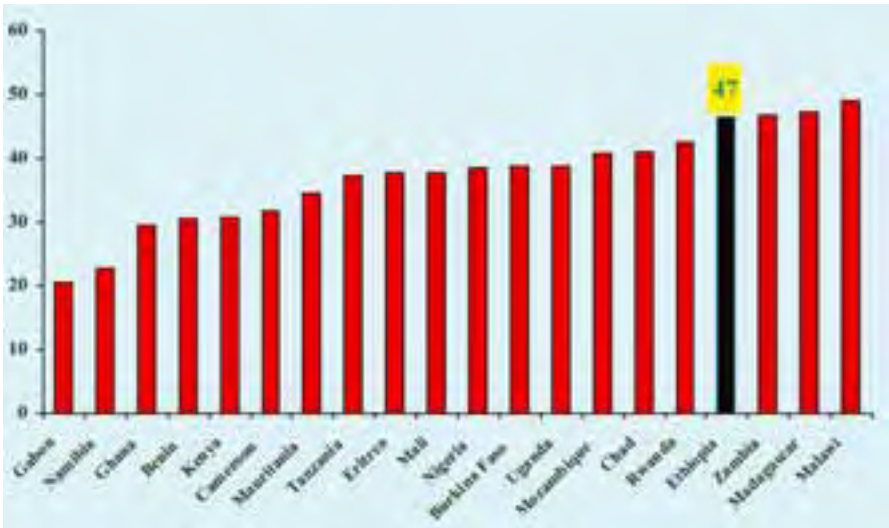


Figure 13.1 Prevalence of stunting in children under five, in selected African countries. (Source: AED/Linkages, 2006)

Other data you have to collect is on the coverage of essential community based nutrition services such as de-worming, vitamin A supplementation, and iodised salt coverage. This can be collected during nutrition interaction programmes or when you visit households (see Figure 13.2). The accuracy and reliability of all the data that is generated at the health post level is crucial.

13.2 Objectives of the NIS in Ethiopia

A major objective of the NIS is to use nutrition data to support timely warnings for short-term prevention, preparedness and response. One aim is to increase the use of data generated from routine community based nutrition interventions, and link these data to an early warning system (EWS) at *woreda* and regional levels for early warning purposes.

The following are additional key objectives of the NIS in Ethiopia:

- To support timely warnings of possible household food insecurity
- To provide accurate and reliable information on trends
- To provide inputs into management decisions, planning and monitoring of nutrition programmes.

Figure 13.2 Health Extension Practitioner collecting data from the household. (Photo: UNICEF Ethiopia / Indrias Getachew

Activity 13.1 The importance of routine service generated data

As you have read, generating accurate data and communicating this in a timely way is an important part of your job. Read the questions below and think carefully about your responses before reading the answer that follows.

(a) What kind of information from the routine data can be used to show household food insecurity?

(b) Why is accurate and reliable information important?

(c) How can information inform the planning of nutrition programs?

Answer

The percentage of children with severe acute malnutrition (SAM) in a community is a good example of data that can be used to detect household food insecurity and indicate the severity of the situation. According to the national emergency nutrition intervention guideline, if there is more than 5% of children under five with in a community, there is a need to initiate different interventions to address this problem.

Information is therefore needed for effective decision making. To enable you and your manager to make effective decisions, the information you collect needs to be accurate, relevant and communicated in a timely way.

Reliable information generated from the routine services can also help you to plan essential interventions at the community level. For example; using information about your community's needs to access important supplies including vitamin A capsules, de-worming tablets and bed nets.

13.3 Why Ethiopia has an NIS

Ethiopia is one of the most disaster-prone countries in the world. Famines and food shortages brought on by drought have been a major problem through the years, and to a lesser extent there have also been problems triggered by flood, pests and livestock diseases. The recorded history of famine and food shortages in the country goes back hundreds of years, with considerable loss of human life and the destruction of property. In addition to climate, the roots of Ethiopia's vulnerability to disaster are in its subsistence economy. About 80% of the population remain subsistence farmers, with another 10% being pastoral nomads.

Currently, the food and nutrition information system is being compiled, analysed and used for decision-making by the Disaster Risk Management and Food Security Sector (DRMFSS). The creation of the DRMFSS has created a capacity for prior awareness of the need for disaster preparedness, encompassing, among other things, the ability to provide advance warnings and to develop response mechanisms based on an effective early decision making system.

However, despite the high prevalence of undernutrition and the history of nutrition crises in Ethiopia, nutrition indicators that can be used for effective decision-making are not routinely reviewed for early warning. To fill this information gap, using selected nutrition indicators from routine health programmes is a practical alternative.

- Why is an NIS so important for Ethiopia?

- Ethiopia is a country where there is food insecurity and considerable vulnerability of households to seasonal food shortages. Availability of reliable information that can assist in early recognition of the problem for timely intervention is highly important.

Now that you have read about the NIS and its relevance to Ethiopia, you are going to look at the critical indicators and their data sources that come from the routine services that you deliver in the community.

13.4 Critical indicators and data sources for the NIS in Ethiopia

One of the most important sources of data for the NIS is the routine service data that you record. The following basic information is needed in order to track the nutrition situation in Ethiopia:

- Micronutrient coverage (vitamin A, iodine, iron)
- Growth of children under two years (growth monitoring coverage)
- Prevalence of acute malnutrition (severe acute malnutrition and moderate acute malnutrition)
- Birth weight
- Maternal nutritional status during pregnancy and lactation.

13.4.1 Sources of data for the NIS

Nutrition information can be generated from active surveillance activities (e.g. pocket surveys) which require an active data search. One of the major disadvantages of an active data generation strategy is that it is very costly. Secondly, it is difficult to develop uniform indicators that can detect progress in the common nutrition success indicators at national levels because the data from the active surveillance usually come from small studies which are not representative of the different regions.

The alternative is using data from the routine service records such as growth monitoring records. The data you record and report from community-based nutrition activities, child health days and therapeutic feeding programmes could be used to generate uniform indicators for looking at trends in indicators of certain nutrition situations. This allows comparisons over time across all regions of the country (either by yearly or seasonal variation). So your role in providing accurate and clear information is very important (Figure 13.3).

Figure 13.3 Health Extension Worker in her health post in rural SNNPR (Photo: Dr Basiro Davey)

Box 13.1 sets out the kinds of data you would collect from community-based nutrition (CBN) programmes and therapeutic feeding programmes (TFP) and what indicators can be drawn from the data of community level and how the data might be used nationally.

Interpreting changes in nutrition indicators requires an understanding of the normal levels of undernutrition in the community, as well as agricultural, economic, health, and other factors. As you run your routine CBN services, the data generated as a result of these services could be useful in calculating key nutritional indicators that can support effective decision making.

Box 13.1 Routine service data to estimate nutrition status of a community

	Data (collect and record monthly)	Indicator	National relevance
CBN	Total number of children under two years old with weight for age <–2 and >–3SD	Prevalence of moderate underweight	Growth performance
	Total number of children under two years old with weight for age <–3SD	Prevalence of severe underweight	Growth performance
TFP	Number of children who were admitted	Baseline information	
	Number of children (and percentage of total) who stopped attending the programme	'Defaulter' rate	Take up of the programme; enables community and regional comparisons
	Number (and percentage) of children who failed to recover fully	Treatment failure	Informs continuing improvement in programme design
	Number of children (and percentage) who died	Mortality rate	Progress towards MDGs; informs national strategy for community nutrition interventions

The information in Box 13.1 is just an example of the kind of data collection you'll be expected to carry out. As you've read in the other study sessions in this Module, you will be collecting a range of measurements (height, length, MUAC) and other information (e.g. vitamin A coverage, de-worming coverage, households screen or iodised salt use) that together help to provide a detailed picture of the nutritional status of your community.

■ Why is it important to have an NIS?

□ As long as data is recorded accurately and communicated in a timely way, it provides a source of information (indicators) that will help create appropriate and effective solutions to address the nutritional needs in communities.

Indicators are useful for community programme planning to establish priorities for problems, set goals, formulate plans of action and implement, monitor, and evaluate community efforts aimed at achieving the Millennium Development Goals (MDGs). Each village then can determine its requirements and plan for further action, based on the indicators generated, that will best address its particular nutritional needs.

13.5 The triple A cycle approach

The NIS should be a continuous (cyclic) process which is undertaken regularly using the principle of the triple A cycle used in CBN, which you learned about in Study Session 11 of this Module. Information generated by the NIS can be use for decision making from your local community level to the national level. As you will remember from Study Session 11, the triple A cycle has:

- An *assessment* aspect involving service generated data recording and timely reporting
- *Analysis* and interpretation of the data based on the national guidelines and procedure
- An *action* component which involves decision making and implementation using the information, which in turn will automatically be followed by another assessment.

This is illustrated in Figure 13.4, which shows how each element of the cycle is connected to the other.

Figure 13.4 Using the triple A cycle in nutritional surveillance.

The data you record as part of routine programmes is a critical element of nutrition intervention programmes and therefore needs to be recorded accurately and reported in a timely way. Figure 13.5 illustrates how data collection informs decision making through the different level, right up to the Federal Ministry of Health.

Figure 13.5 How local data informs national decision-making.

13.6 Conclusion

In this Module you've learned about the basics: food, diet and nutrients, and the different nutritional requirements throughout the human lifecycle. You have looked at nutritional problems of public health importance in Ethiopia and the role you can play as a Health Extension Practitioner in identifying and recording nutrition problems in your community and how can you advise and support the individuals you work with to find effective nutrition solutions. As you've learned, the nutrition information you generate at the *kebele* level can be used to monitor nutrition indicators and to inform decision making at different levels.

Summary of Study Session 13

In Study Session 13 you have learned that:

1 A nutrition information system (NIS) is a system of continuous collection and interpretation of nutrition-related data to enable timely decision making for improving the nutrition situation of the population.

2 A good NIS should enable early detection of food insecurity, be promptly available for making policy decisions and developing action programmes.

3 It should utilise data and information already available from the routine service returns. As a Health Extension Practitioner you are in the ideal position to collect and process information about your community.

4 The NIS should target nutrition indicators based on the essential nutrition action components. These indicators are useful to assess progress towards achieving the Millennium Development Goals and assessing programme performance in particular. Nutritional indicators also help in planning community-based nutrition intervention programmes.

5 Key nutrition indicators can be generated from community-based nutrition, therapeutic feeding programmes and child health days.

6 The power of information for decision making relies on accurate data and information being communicated in a timely way. As a Health Extension Practitioner you need to maintain the quality of all information generated from a community-based nutrition programme and timely reporting.

7 You can make use of the data generated from the routine services you deliver in the community for assessing progress and for planning interventions.

Self-Assessment Questions (SAQs) for Study Session 13

Now that you have completed the study session, you can assess how well you have achieved its Learning Outcomes by answering these questions. Write your answers on your Study Diary and discuss them with your Tutor at the next study support meeting. You can check your answers with the Note on the Self-Assessment Questions at the end of the Module.

SAQ 13.1 (tests Learning Outcome 13.3)

Why is the routine service data you collect regularly so important?

SAQ 13.2 (tests Learning Outcomes 13.1, 13.2 and 13.3)

What is the NIS and how does it contribute to solving Ethiopia's food problems?

SAQ 13.3 (tests Learning Outcomes 13.4 and 13.5)

When and how, during your work in the community, can you gather information about key nutrition indicators?

SAQ 13.4 (test Learning Outcomes 13.4 and 13.5)

(a) What kind of indicators can be generated during child health days?
(b) How can this data be useful for the NIS?

SAQ 13.5 (tests Learning Outcome 13.5)

Summarise the kinds of data you need to record and report regularly.

Notes on the Self-Assessment Questions (SAQs) for *Nutrition*

Study Session 1

SAQ 1.1

The four main kinds of malnutrition in Ethiopia are acute and chronic malnutrition, iron deficiency anaemia, vitamin A deficiency and iodine deficiency disorder.

The signs you would look for include:

- Many children under five who are underweight
- Many children who are very small for their age
- Many children who frequently suffer from disease and illness
- A high infant death rate
- Many children who find learning difficult
- A high proportion of children suffering from blindness.

SAQ 1.2

You know yourself that this is a question about nutrients. But you need to explain this simply and clearly to Mrs Y. Perhaps you might say that different kinds of food do different jobs. Some help to build the body, some produce energy and some prevent disease. So she needs to make sure that, in addition to carbohydrates, her family also eats some fats, some proteins and some micronutrients every day. (You could choose examples of these which are most common in your community.)

SAQ 1.3

If total population of Afeta is 4800, then the number of:

- Children under two children is $4800 \times 8/100 = 384$
- Children under five years is $4800 \times 14.6/100 = 701$
- Pregnant and lactating women is $4800 \times 4/100 = 192$

Therefore, the number of children under two years in Afeta is 384, while the number of under-fives is 701. Afeta also has 192 pregnant and lactating women in one year.

SAQ 1.4

Mrs X is right to be worried. Body-building nutrients are very important for pregnant women. Mrs X could tell her family that without rest and plenty of food she risks the baby being born with low birth weight. And low weight babies grow up with more chance of being ill, may do less well at school and may grow into adults who are unable to work effectively.

SAQ 1.5

All the goals are linked but you may have suggested something like this:

- Better-nourished children are less likely to die than underweight children (MDG 4);
- Better-nourished children will do better at school (MDG 2)
- Women who are well nourished are less likely to give birth to underweight babies (MDG 4)
- Adults who are well nourished can work better and plan for the future (MDG 1).

Study Session 2

SAQ 2.1

Carbohydrates provide energy. They are found in many foods including bread, potatoes, maize and bananas.

Proteins are important for growth. They are found in meat, dairy products, fish and nuts.

Fat is important for energy. It is found in meat and dairy products, avocados, oils and nuts.

They are all macronutrients.

SAQ 2.2

(a) Fish and vegetable oils are better than animal fats, which are saturated fats.
(b) The child with diarrhoea needs to drink lots of water.
(c) The man needs to include fibre in his diet (e.g. cabbage, avocado, bananas, legumes and cereals), as this will help to deal with his constipation.
(d) Vitamin C, which can be found in fresh fruit, is particularly important for helping to heal wounds.
(e) Because dairy products provide calcium which is necessary for strong bones and teeth it is important that children have a sufficient amount in their diet. (Although some other foods also contain some calcium.)

SAQ 2.3

Animal sources of food are an important part of a balanced diet because they add proteins, fat and vitamins to a diet. In particular, iron is more easily absorbed from an animal than a plant source. However, very little meat is needed, and if food like beans, nuts and dairy products are included in the diet then a family can have a balanced diet, without including meat.

Study Session 3

SAQ 3.1

When advising a pregnant woman what to eat, you would first tell her that it is very important to gain weight during her pregnancy (at least 11 kilograms). Then you need to advise her about eating foods that contain vitamin A, iron and iodine, and making sure she has enough energy. She needs to eat a well-balanced diet but there is no need for expensive additional foods.

SAQ 3.2

If a mother tells you she does not have enough milk for her baby you would want to ask her if she is eating enough (more than she did before becoming a mother), and if she is eating a good mix of food. You would also want to ask her if she is drinking enough. Finally you need to know if she received a dose of vitamin A shortly after giving birth and if she is now eating food containing high amounts of vitamin A.

SAQ 3.3

There are many differences between the nutritional needs of children and elderly people but you might have chosen two of the following:

- Small children have a higher basal metabolic rate than older people so need more nutrients
- Children have huge energy requirements so need more calories than older people
- Children need more water because they are at greater risk of dehydration
- Older people might have physical problems which make eating difficult
- Older people need more vitamin D.

SAQ 3.4

A mother whose adolescent son is eating a lot does not need to worry unless he is eating a lot of one type of food. Adolescents experience a growth spurt at the age of 15/16 so need a large intake of all kinds of nutrients during this time.

Study Session 4

SAQ 4.1

If babies and young children can be fed well there is a real opportunity to break the cycle of malnutrition. However, at the moment, many babies are not exclusively breastfed and many infants are given complementary food too early or too late. These problems are due to lack of knowledge on the mother's part. Therefore, it is important they receive more information and advice, and as a Health Extension Practitioner you are in a good position to be able to do this.

SAQ 4.2

When giving education to mothers about breastfeeding, you could tell them that breastmilk is an irreplaceable gift of the mother to the baby because it protects the baby from different infectious diseases. In addition, the fat in breastmilk has been found to be very important for the development of the brain. Breastfed children show better intelligence compared to bottle or formula fed ones.

Breastfeeding also has other advantages. It has contraceptive and uterine-contracting effects that help the mother to space pregnancies and prevent postpartum haemorrhage, respectively. And it is also readily and freely available, and saves household expenditures for feeding the baby.

So the working mother should express her breastmilk and get the baby fed by the caregivers when she is at the work.

SAQ 4.3

When advising a mother who is expecting her first baby you need to tell her to start breastfeeding within an hour of birth; to breastfeed frequently; to give the baby only breastmilk for the first six months; and to eat more than usual herself. You might also want to tell her now about how to position the baby. And you should also tell her that if she has any difficulties she should ask you how to overcome these.

SAQ 4.4

If you are advising an HIV-positive mother who cannot afford to buy replacement foods, you should tell her that:

- She should practice exclusive breastfeeding for six months and then introduce appropriate complementary foods
- If she experiences breast difficulties such as mastitis, cracked nipples or breast abscess, she should breastfeed with the unaffected breast and express and discard milk from the affected breast
- She should seek immediate care for a baby with thrush or oral lesions
- If she experiences AIDS-related conditions (prolonged fever, severe cough or diarrhoea, or pneumonia) she should visit a health centre immediately
- She should use condoms to protect herself from exposure to infected semen.

SAQ 4.5

If a mother tells you that breastfeeding hurts, the reasons might be engorgement, sore or cracked nipples, or plugged breast ducts and mastitis. You should advise her to continue breastfeeding, giving her information about the appropriate solutions to relieve the problem.

SAQ 4.6

Key messages about optimal complementary feeding include the following:

- At six months, the mother or caregiver should introduce soft, appropriate foods and continue breastfeeding on demand
- She should give a range of different foods
- She should increase complementary food if the child becomes sick
- The mother has to increase the amount of food the baby eats as the baby grows older, increasing food thickness (density) and variety
- She should practice good hygiene and safe food preparation
- She should interact with the child during feeding (active/responsive feeding).

Study Session 5

SAQ 5.1

Nutritional assessment is used to determine whether a person or group of people is well nourished or malnourished (over-nourished or under-nourished). It involves the interpretation of anthropometric, biochemical (laboratory), clinical and/or dietary data.

SAQ 5.2

An anthropometric index is a combination of two measurements (or a measurement and an age). An indicator is an index combined with cut-off values.

SAQ 5.3

In order to make a nutritional assessment, you can measure height, weight, body mass or mid-upper arm circumference.

SAQ 5.4

In order to determine whether a child is suffering from acute malnutrition you can assess the following:

- the weight of the child compared with reference child of the same height
- whether the child is suffering from bilateral pitting oedema
- the child's MUAC
- whether there are signs of severe wasting.

SAQ 5.5

Indicators of moderate malnutrition in:

(a) Children: MUAC = 11–11.9cm

(b) Pregnant women: MUAC = 17 to 21cm OR

18 to 21cm with recent weight loss.

SAQ 5.6

The following list shows the clinical signs/symptoms and the nutritional problems they indicate:

(a) Pallor = anaemia
(b) Goiter = iodine deficiency disorder
(c) Bitot's spots = vitamin A deficiency
(d) Bilateral pitting oedema = severe acute malnutrition
(e) Severe visible wasting = acute malnutrition

Study Session 6

SAQ 6.1

You have to use the growth chart to decide the nutritional status of Chaltu.

- Her weight for age is below the third centile
- Her weight for height is < 70%
- Her height for age is below the third centile
- Her MUAC is 10.5cm and has bilateral pitting oedema.

Chaltu has severe acute malnutrition (because her weight for height is < 70%, her MUAC < 11cm, and she has bilateral pitting leg oedema). Any one of these three signs is enough to classify Chaltu as having severe acute malnutrition (SAM).

Chaltu is also stunted (because the height for age is below the third centile) and she is also underweight (because her weight for age is below the third centile).

SAQ 6.2

The immediate cause of Chaltu's malnutrition may be the diarrhoea that she had for the last two weeks.

The underlying cause may be either family food shortage (because many family members have to live off a very small piece of land that is not very fertile), poor childcare by the mother because she has many children to care for or a combination of these factors.

The basic cause in this case may be poverty, which is the common basic cause in many of malnourished families.

SAQ 6.3

As a Health Extension Practitioner you may be able to advise Chaltu's family on proper feeding practices, strong family planning services, dietary diversity, proper care and treatment of her current illnesses, and on the need for education of children (both girls and boys).

SAQ 6.4

Malnutrition is a major public health problem in Ethiopia and has a significant impact on communities, in particular for women and children. Millions of children die of severe acute malnutrition each year and poor nutrition prevents many children and adults from ever reaching their full mental and physical capacity. For example, children who are malnourished are at risk of stunting, which affects their productivity when they are older; malnutrition also affects their learning ability, school performance and attendance. All of these consequences have a social and economic impact on the community and the country.

As a Health Extension Practitioner you can help to minimise the effects of malnutrition in your community. In particular, through good maternal and child health care, you can help promote good feeding practices in families and emphasise the importance of clean water for drinking, cooking and cleaning. You can also support strong family planning services to help families space or limit the number of children they have. Other examples where you will have a role include advocating for basic education for girls as well as boys, encouraging communities to grow a wide range of nutritious foods and to ensure particularly that children and pregnant mothers have the right amount of food they need to be healthy.

Study Session 7

SAQ 7.1

Vitamin A deficiency (VAD) results in a child's immune system being severely weakened. This means illness is more common and likely to be more severe, and leads to an increase under-five death rates. VAD can also lead to eye damage; if lesions on the eye are severe, this can cause blindness.

SAQ 7.2

The most vulnerable group affected by micronutrient deficiencies, in any community, are frequently children and lactating mothers. This is certainly the case in relation to VAD. However, for iodine deficiency disorder (IDD), people of all ages and sexes are vulnerable, but this deficiency is more critical for the fetus, young children, pregnant women and lactating mothers. In case of iron deficiency anaemia (IDA), vulnerable individuals include low birth weight infants, children aged 6–24 months, adolescent girls, pregnant and lactating women, and people living with HIV and AIDS.

SAQ 7.3

The consequences of IDD are summarised in the table below

In pregnant women, fetuses and newborns	In infants, children and adolescents	In adults
• Decreased fertility	• Hypothyroidism	• Goitre and its complications
• Spontaneous abortion	• Impaired coordination	• Hypothyroidism
• Stillbirths, congenital abnormalities	• Impaired mental function	• Impaired mental function
• Neonatal mortality	• IQ 13 points lower	• Lower energy and productivity
• Cretinism	• Retarded mental and physical development	
• Psychomotor defects	• Diminished school performance	

Iron deficiency anaemia affects more than half of children under the age of five and around 27% of women in Ethiopia so it is a serious issue. The consequences of IDA are possible increased risk of maternal mortality, premature birth to low birth weight, and infant mortality. It also impacts of children's capacity to learn and adult productivity.

SAQ 7.4

There are a range of actions you can take as a Health Extension Practitioner to prevent and treat micronutrient deficiencies in your community. For example you can provide Vitamin A capsules, iodine capsules and iron folate for prevention of VAD, IDD and IDA respectively. You can work with individuals and families and advise on food diversification and food fortification, which will help to ensure a more healthy diet.

The other important aspect of your role is to mobilise communities and work with other development workers in your community to produce of fruit and vegetables using backyard gardens, which will help to improve access to vitamin A-rich foods. You can also support community child health days and use these to ensure a supply of vitamin A capsules and the other necessary materials to supplement people's diets.

Study Session 8

SAQ 8.1

Availability of food is only one aspect of food security. People must also be able to access the food and then make it into something that can be eaten.

SAQ 8.2

Who is the most vulnerable to chronic food insecurity will depend on whether you live in a rural or an urban community. You will probably have noted that the additional groups vulnerable to acute food insecurity are those affected by sudden shocks like drought or a rise in food prices (look back at Table 8.1 if you need to see the range of vulnerable groups).

SAQ 8.3

You may well think of many causes of food insecurity in your community. However, try to choose three that you think are the most important and be ready to discuss the reasons for your choice with your Tutor.

SAQ 8.4

If people are leaving their area each day to look for work, this is a stage 2 coping strategy. Once people sell land or livestock they are putting their futures at risks, so will leave this until they have tried all other coping strategies.

SAQ 8.5

According to the Food and Agriculture Organisation, Ethiopia is one of the countries where more than 30% of the population is insecure. A child's body responds to chronic hunger by decreasing in size (stunting). This results in poor physical growth, mental development, affecting socioeconomic development. It also results in more illness and higher death rates in children and adults.

The greatest food insecurity is in the north and east of the country.

SAQ 8.6

Women play a crucial role in agriculture and marketing of produce; they are also key to controlling population growth and to controlling HIV.

SAQ 8.7

(a) The most vulnerable people in your community are likely to be very young children, pregnant and breastfeeding mothers, the elderly, orphans and disabled people

(b) Strategies to help these groups of people include selective feeding programmes, either targeted supplementary programmes or blanket supplementary programmes.

Study Session 9

SAQ 9.1

The aim of intervention for moderate acute malnutrition is to rehabilitate children who are moderately malnourished, to prevent further deterioration of vulnerable groups of people (such as pregnant women and lactating mothers) who are moderately malnourished and to support adequate intake of nutritious food for such vulnerable groups. As a Health Extension Practitioner, you need to be aware that children under five, pregnant women and lactating mothers are particularly at risk because they have increased nutritional needs. You will work with families, taking into consideration the kinds of food they have available, to advise them on the most nutritious diet possible. As far as possible, you should explore local solutions to support children and vulnerable women, as this is likely to lead to a more sustainable approach to rehabilitation.

SAQ 9.2

(a) Jemila's MUAC is 11.5cm which comes within the range indicating that she has moderate acute malnutrition (11-11.99cm). As there is no oedema, Jemila does not have severe acute malnutrition, but you would need to monitor her progress carefully.

(b) You could use the opportunity of a CHD to monitor Jemila's progress and to provide advice to Jemila's mother or caregiver. Activities undertaken as part of CHDs include vitamin A supplementation and promotion of infant and young child feeding.

SAQ 9.3

If there is no supplementary feeding programme in your community, you can help manage a child's moderate acute malnutrition in a number of ways. For example you can talk with the primary caregiver why they think the child has become malnourished. You will be able to provide nutritional advice to the whole family to ensure the malnourished child is given more energy-rich food, as well as more fat and protein in their diet.

SAQ 9.4

It is important to plan carefully for a CHD and to ensure your community is informed of the date in advance. You need to consider where you will hold the CHD, and that the place you select is in a suitable location with enough space for the services you are going to provide (for example, a school, a health post or a veranda with good shade). An important part of the planning includes organising the services in a logical order, from a service where a child is least likely to cry to one that may create some discomfort to a child. This will also help you to control the direction of the flow of clients through the services. If you start the service at the right time, this will help to minimise the time mother and caregivers will have to wait, and promote effective crowd control.

Study Session 10

SAQ 10.1

(a) Dawit's MUAC is in the 'moderate acute malnutrition' range because his MUAC is between 11cm and 12cm. Look back at Table 5.3 if you need to remind yourself of the different ranges of MUAC. His weight for height is also in the 'moderate acute malnutrition' range because it is between 70% and 80% of what would be the normal weight for an infant of his age. However you would class Dawit as having 'severe acute malnutrition' because he has oedema. Any child who fulfils one criterion for severe acute malnutrition (and oedema falls into this category) will be classified as having severe acute malnutrition.

(b) Because Dawit is six months old, he does not automatically need to be referred to an in-patient facility. If Dawit had complications however – such as the presence of general danger signs, pneumonia/severe pneumonia, blood in the stool, fever or hypothermia – his classification will be 'severe complicated malnutrition'. This means he needs to be referred to an in-patient facility for stabilisation of his clinical condition. Another indicator that would require Dawit to be referred to an in-patient facility would be if he failed the appetite test. You should recall that in the appetite test, there is a minimum amount of food that the child should take for their weight range. For Dawit, because his weight comes in the range of 4 – 10kg, he needs to take ¼ – ½ of a sachet to pass the appetite test. If he does not pass, then he needs to be referred.

SAQ 10.2

(a) The appetite test is an important indicator of how seriously malnourished a child may be and whether they need to be referred for in-patient care. A child who is unable to take the minimum amount of RUTF required to pass the appetite test should be referred to and receive care from the nearest Therapeutic Feeding Unit or Stabilisation Centre for in-patient management.

(b) If a malnourished child does not need referring to an in-patient facility they can be registered for an Out-patient Therapeutic Programme (OTP). You should explain to Dawit's family how to help with the OTP treatment and then you would register Dawit in the OTP registration book, and fill out the OTP card which will allow you to build up a record of his treatments and progress.

(c) There are a number of key messages that you can give the parents — compare your answer with the messages in the list below. You may want to write these in your Study Diary to refer to when following up children on an OTP day, as a reminder of the points you want to share with parents.

- Plumpy'nut® (RUTF) is a food and medicine for malnourished children only. It should not be shared
- For breastfed children, the mother should always give breastmilk before the RUTF; she should continue to breastfeed on demand
- RUTF should be given before other foods. The mother or caregiver should give small regular meals of RUTF and encourage the child to eat, every three to four hours
- The child should always be offered plenty of clean water to drink while eating the RUTF
- The mother or caregiver should always use soap and water to wash their hands before feeding the child

- Food should be kept clean and covered
- Sick children get cold quickly, so the child should be kept covered and warm.

SAQ 10.3

(a) The registration book is used to enable you to prepare monthly reports and analyse the performance of your OTP. You will be able to compare the monthly performance of your health post with other health posts and with the standard that is set at your *woreda* or regional level. You can also see the trend of mortality rate and/or recovery rate over several months to see if your efforts to improve the quality of the OTP services are bearing fruit.

The OTP card enables you to follow children efficiently on a weekly basis. You have to record each key indicator for the child and this will help you follow up the child's progress in the course of the treatment (and remind you which ones you need to check). You should explain to the parents or caregiver the importance of the registration book and OTP card for the management of children in your community who have severe uncomplicated malnutrition, so they know why you are taking this information.

(b) When you make follow-up visits to the home, you will want to see how the malnourished child is progressing. You would ask the parents or caregiver whether the child has had diarrhoea, vomiting, fever or any other new complaint or problem since the last visit. You would also want to ensure that the child is finishing the weekly ration of RUTF. Other indicators you need to look for include whether there are any other complications, the child's temperature, weight and MUAC. You should also check whether the child has oedema and finally, do the appetite test.

SAQ 10.4

If a child was admitted to an in-patient facility with oedema on both feet, there need to be two consecutive visits (14 days) where there is no presence of oedema before the child can be discharged. For a child who was admitted without oedema, the criterion for discharge is when the child reaches its target weight. On discharge from the facility you would need to counsel the mother on feeding and caring for her child at home. If the service exists, you can provide the mother or caregiver with a discharge certificate and make a referral for the child to the supplementary feeding programme.

SAQ 10.5

There are different ways to ensure that your community is aware of the services available in OTPs. Using formal and informal ways to communicate with people (e.g. talking to respected men and women in your village who other people will listen to, so they can promote awareness of OTP days) will be important. You can also ask *kebele* administrators and Gott leaders to use their meetings to pass on key messages. Assigning a fixed day in the week as an OTP day will help caregivers to remember the day of their appointment. If you plan ahead and anticipate the stocks you need, based on your caseload, this will help ensure you can provide the best possible treatment and care for managing severe malnutrition in your community.

Study Session 11

SAQ 11.1

(a) Nutrition behaviour change communication (BCC) is different from nutrition education in that BCC needs at least three contacts to change behaviour. Unlike nutrition education, which aims at increasing awareness or knowledge, BCC targets change of behaviour or practice.

(b) BCC is important because it can influence and lead to lasting change in an individual's behaviour and practice. There are several stages a person is likely to go through, from a stage of pre-awareness, where they are not even aware of the change they need to make (for example, not knowing about the importance of exclusive breastfeeding, through the intention to make the change, but uncertain how to do this and therefore needing encouragement) through to adopting and maintaining the new behaviour (exclusive breastfeeding) and becoming an advocate of the practice to others in the community. BCC is therefore more than just education; it is about promoting sustained changes in the way a person does something.

SAQ 11.2

Stage of behaviour change	Action needed
1. Pre-aware	c. Build awareness/provide information
2. Aware	f. Persuade/give more information
3. Contemplation/intention	b. Encourage/discuss benefits
4. Trial	e. Negotiate and help to overcome obstacles
5. Maintenance	a. Discuss benefits and provide support at all levels
6. Telling others	d. Praise/reinforce the benefits

SAQ 11.3

In order to help prevent vitamin A deficiency there are a number of important messages to give your community:

- The importance of breastfeeding
- The need for vitamin A supplementation
- Consumption of vitamin A-rich foods (dark green leafy vegetables, yellow and orange fruits and vegetables) is part of a healthy and balanced diet.

SAQ 11.4

The critical health contact points are important for nutrition BCC for the following reasons:

- They can be used as an opportunity to educate mothers /care givers about nutrition
- Mothers are likely to implement the suggested actions or when you do a home visit.

SAQ 11.5

Other non-health contacts, including with schools, emergency services, agricultural activities, and water and sanitation programmes can also be used as contacts to pass on nutrition messages. You can play an important role in working with other professionals in your community to promote key messages about nutrition.

SAQ 11.6

(a) The steps in delivering nutrition counselling are abbreviated as GALIDRA: greeting, asking the mother what her problem is, listening to what she is saying, identifying the causes of her problem and potential resources, discussing the alternative solutions with the mother, recommending the best alternative and appointing the mother

(b) Nutrition counselling is important because it is an individual BCC strategy that gives you an opportunity to involve the mother or any individual in the community in seeking a solution to his or her problem. Because it follows a triple A cycle, it has high potential in bringing about behavioural change.

SAQ 11.7

The triple A cycle is a process of assessment of the nutrition situation of vulnerable segments of the population, analysis of the possible causes of the problems and possible solutions, and action based on the evidences obtained from the analyses and reassessment. The triple A cycle is used in many activities related to nutrition, such as growth monitoring and maternal counselling on child feeding and nutritional surveillance.

SAQ 11.8

Different informal community gatherings can be used as an opportunity for passing the key messages of the essential nutrition actions. For example: market days, 'Debo', 'Edir', 'Equb', Coffee Ceremonies 'Mahiber' and 'senbete'.

SAQ 11.9

The following are important focus areas for nutrition BCC in Ethiopia:

- Promotion of ENAs.
- Promotion of food-based approaches to enhance the production and consumption of a wide range of nutritious foods.

A balanced and healthy diet is the key outcome.

Study Session 12

SAQ 12.1

Nutritional status and the progression of HIV are strongly interrelated. HIV infection increases the body's energy needs while it diminishes appetite and decreases the body's ability to digest food and absorb nutrients. This leads to malnutrition which in turn accelerates the HIV infection.

SAQ 12.2

1 Nutrition care and support helps break the vicious cycle of HIV and malnutrition by helping people living with HIV (PLHIV) maintain and improve their nutritional status, improve their immune response, manage the frequency and severity of symptoms, and improve their response to antiretroviral therapy (ART) and other medical treatment.

2 There are seven strategies you could advise PLHIV to adopt to increase their chances of being healthy and strong. These include maintaining a healthy life style, eating energy-rich foods, drinking clean water, having regular health checks for weight and taking appropriate medicines. As a Health Extension Practitioner you can encourage PLHIV in your community to seek early treatment for symptoms and advise them on how they can manage these through diet and maintaining high levels of hygiene and sanitation.

SAQ 12.3

(a) The preferred recommended infant feeding option to an infant born to HIV-positive mother is exclusive breastfeeding for the first six months of life. Appropriate complementary foods should be introduced at six months of age with continued breastfeeding. Breastfeeding should stop only when a nutritionally adequate diet without breastmilk can be provided. This is usually around 12 to 18 months of age.

(b) The majority of the mothers in your communities can't fulfil the AFASS criteria and children who are not breastfed are at high risk of developing malnutrition and numerous childhood infections. Therefore the survival of the infant will be significantly affected.

SAQ 12.4

As a Health Extension Practitioner, you may be able to perform the following measures to help decrease MTCT of HIV for an infant who is breastfeeding and who has been born to an HIV-positive mother:

- Screen HIV-positive mothers for ART eligibility (see the *Communicable Disease* Module)
- Provide an effective ARV prophylactic regimen for non-eligible women and their infants
- Actively support exclusive breastfeeding from birth until six months
- Advise mothers not to mix feed because this increases the risk of MTCT
- Advise mothers how to maintain good breast health and seek immediate attention for cracked nipples, mastitis or abscesses
- Promote and support the initiation of complementary feeding at six months and recommend continuing breastfeeding until 12 – 18 months
- Support mothers to avoid becoming infected with HIV during breastfeeding (counsel on safe sex).

Study Session 13

SAQ 13.1

The routine service data you collect is important because it can be fed into Ethiopia's NIS. It will also help you understand the nutrition situation in your community and help you to make local decisions.

SAQ 13.2

The NIS is a system of continuous collection, analysis and interpretation of data about nutrition. It can be used to detect malnutrition epidemics, identify trends, make decisions about interventions and monitor programmes.

SAQ 13.3

You can gather data from a number of sources including from the community-based nutrition programme, the therapeutic feeding programme and community health days.

SAQ 13.4

(a) The data you record at child health days can tell you the prevalence of severe underweight children in your community and can also be used by the NIS to measure national growth performance.

(b) SAM data can be used by NIS as an emergency warning sign, the percentage with MAM can show the effects of supplementary programmes and all the information will add generally to information about trends and seasonality. Community Health Days can generate indicators related to the prevalence of SAM and MAM, de-worming coverage, vitamin A coverage, and iodised salt coverage.

SAQ 13.5

You should regularly record data related to the weight of children, the success of the therapeutic feeding programme, the numbers of pregnant and lactating women. You also need to record information about children under five and treatments they have received.