



NUTRITIONAL STATUS

You know that we need food to grow. The food that you eat is digested and absorbed in your body. The diet provides nutrients which are required in varying amounts in different parts of the body. These nutrients are utilised by the body for performing specific functions. This means that good nutrition is the basic component of good health. You have read about balanced diet. Do you remember that it is of utmost importance in achieving normal growth and development and for maintaining good health throughout life? When your diet provides the nutrients in incorrect amounts, either very less or in excess of what is required, it results in an imbalance of nutrients in your body. This condition is responsible for various diseases, slow or no growth of body and it can even lead to death.

You know that young children, pregnant women and lactating mothers commonly suffer from health problems arising due to inadequate nutrition. There are several nutritional programmes prevailing in our country in order to solve this problem.

In this lesson, you will learn about the meaning of nutritional status and the ways of assessing it. You will also learn about the various nutritional diseases and different on-going nutrition programmes aimed to prevent and control these problems in our country.



OBJECTIVES

After studying this lesson, you should be able to:

- define the terms "nutritional status" and malnutrition;
- explain the types and causes of malnutrition;
- discuss simple ways to assess nutritional status;



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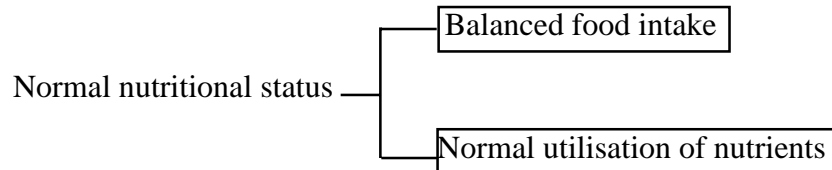
- recognise the signs and symptoms of common nutritional deficiency diseases;
- explain the importance of national nutrition programmes and list some of them;
- state salient features of these programmes.

6.1 NUTRITIONAL STATUS

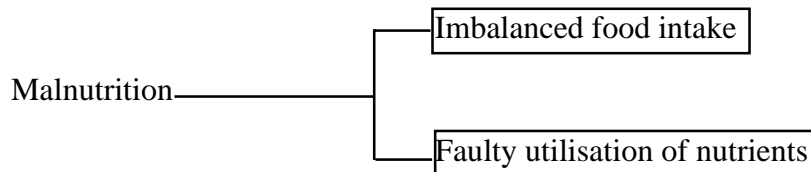
The condition of health of a person that is influenced by the intake and utilisation of nutrients is called nutritional status.

You know that we need a nutritious diet for our well-being and good health. When our body receives all the nutrients in appropriate amounts so as to meet the needs of the body, then we are in the state of good nutrition. We have a normal nutritional status.

However, when the nutrients provided in the diet are inadequate or not utilised properly, it results in a state of imbalance in the body. If this continues for sometime it may develop into a severe problem which may even prove fatal.



When there is a lack or excess intake of one or more nutrients and/or faulty utilisation of nutrients in our body, it leads to the state of imbalance in the body. This condition is known as malnutrition.



There are two types of malnutrition. The condition of health of a person that results due to the lack of one or more nutrients is called **undernutrition**. However, when there is an excess intake of nutrients, it results in **overnutrition**.

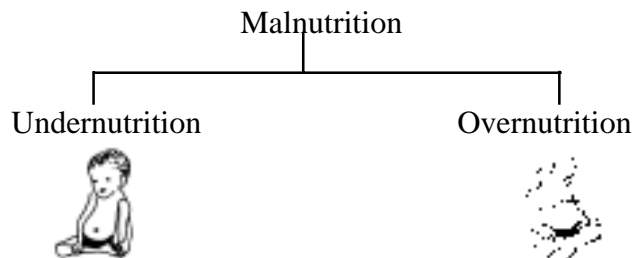


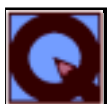
Fig. 6.1



Fig. 6.2

**Notes**

Thus the condition of malnutrition covers both the states of undernutrition and overnutrition. You must have seen people who eat energy rich foods in amounts more than what is required by their bodies become fat/obese. This is the result of overnutrition. This state of being obese is harmful as it may lead to serious health problems. But undernutrition is more common around us. In fact malnutrition has become a synonym of 'undernutrition'.

**INTEXT QUESTIONS 6.1**

1. What is 'Nutritional Status'?
2. Fill in the blanks in each of the following statements by choosing the appropriate word from those given in the brackets :
(deficiency, overnutrition, obese, undernutrition, normal)
 - (i) Malnutrition refers to both _____ and _____
 - (ii) Undernutrition results due to _____ of one or more nutrients.
 - (iii) If you eat too much of energy rich foods, you may become _____.
 - (iv) Eating balanced food and having normal utilisation of nutrients leads to _____ nutritional status.

6.2 CAUSES OF MALNUTRITION

Do you know why malnutrition occurs? Let us look into some of the important factors responsible for causing it.

Causes	Influences
I. Decreased availability of food due to <ol style="list-style-type: none"> i. Increase in population (many mouths to feed) ii. Low production iii. Exhaustion of stocks 	Lowered food intake
2. Ignorance	Wrong infant feeding practices, inability to make correct choice of food resulting in over/undernutrition
3. Economic conditions	Lowered purchasing power causing undernutrition/higher purchasing power causing overnutrition



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- | | |
|---|--|
| 4. Stress conditions | Inability to meet the increased nutrient needs during periods of rapid physical growth, e.g. in young children, adolescents, pregnant woman and lactating mothers; Nutrient demands also increases during illnesses. |
| 5. Poor personal hygiene and environmental sanitation | Increased susceptibility to infections and thereby illnesses |

Can you think of the consequences of malnutrition?

Yes, indeed malnutrition has serious ill-effects. The people affected by malnutrition suffer from deficiencies of different nutrients and have infections. They also have poor physical as well as mental growth and development which cause various handicaps. Malnutrition can also lead to death.

It also leads to decreased work capacity of malnourished population.



INTEXT QUESTIONS 6.2

- Enlist the most important causes of malnutrition (undernutrition).

- Malnutrition may even lead to _____ of many people.
- The consequences of malnutrition are _____,
 _____, _____ and _____.

6.3 ASSESSMENT OF NUTRITIONAL STATUS

Now you will wonder, as to how to know your own or your friends nutritional status. **The process of determining the nutritional status of an individual or a group is known as nutritional assessment.**

There are a few simple ways by which you can know the nutritional status of yourself as well as of others. These procedures are -

- By measuring physical growth;
- By determining dietary intake;
- By recognising nutritional deficiency diseases.

1. Physical Growth

You know that growth is most rapid during early childhood. Therefore, chil-



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dren below 5 years of age are most susceptible to malnutrition. Growth can be determined by measuring the body weight and height. A child at a particular age must have a specific height and weight. In other words, the body weight and height of the child can become the indicator of his/her nutritional status.

How do you know whether a child has normal weight and height? There are standard weights and heights which the child is expected to attain at a particular age. These are called **references** and are shown in Tables 6.1. In case the weight and/or height of the child are below the reference, then the growth is considered to be retarded and we can say that the child is suffering from malnutrition.

Table 6.1
EXPECTED HEIGHT AND WEIGHT FOR AGE

BOYS		GIRLS	
Height (cm)	Weight (kg)	Height (cm)	Weight (kg)
76.1	10.2	74.3	9.5
82.4	11.5	80.9	10.8
85.6	12.3	84.5	11.8
90.4	13.5	89.5	13.0
99.1	15.7	93.9	14.1
99.1	15.7	93.9	15.
102.9	16.7	101.6	16.0
106.6	17.7	105.1	16.8
109.9	18.7	108.4	17.7
113.1	19.7	111.6	18.6
116.1	20.7	114.6	19.5
119.0	21.7	117.6	20.6
121.7	22.9	120.6	21.8
124.4	24.0	123.5	23.3
127.0	25.3	126.4	24.8
129.6	26.7	129.3	26.6
132.2	28.1	132.2	28.5
134.8	29.7	135.2	30.5
137.5	31.4	138.3	32.5
140.3	33.3	141.5	34.7
143.3	35.3	144.8	37.0
146.4	37.5	148.2	39.2



Notes

Nutritional Status

149.7	39.8	151.5	41.5
153.0	42.3	154.6	43.8
156.5	45.0	157.1	46.1
159.9	47.8	159.0	48.3
163.1	50.8	160.4	50.3
166.2	53.8	161.2	52.1
169.0	56.7	161.8	53.7
171.5	59.5	162.1	55.0
173.5	62.1	162.4	55.9
175.2	64.4	162.7	56.4
176.2	66.3	163.1	56.7
176.7	67.8	163.4	56.7
176.8	68.9	163.7	56.6

For example, Sita is 4 years old. Her weight is 12 kg and her height is 99 cm. Look at Table 6.1 and comment on her nutritional status. Compare her weight and height with the reference of a 4 year old girl. Ideally, she should weight 16 kg and should be 101.6 cm tall at her age. In other words not only does Sita weigh less she is also short for her age. This means that her nutritional status is poor and she may be considered as malnourished.

On the other hand, if a child has height and weight (specially) more than the references, he/she is said to be overnourished. This is also harmful for the body.



Activity 6.1: Take weights and heights of 5 children around you. Compare them with the reference tables. What do you observe?

S.No	Age	Height (cm)	Weight (kg)	Observation (Overnourished/ undernourished)
1.				
2.				
3.				
4.				
5.				

You should remember that recording regular weights, say once a month, is important. Excessive weight gain or loss is harmful and should be immediately attended to.



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2. Dietary Intake

It is the second method of assessment. You will remember that balanced diet is essential for all of us to remain healthy.

To assess the nutritional status one needs to record all the food items consumed in the last 24 hours. Household measures are used for recording the food intake.

This information can then be compared with the 'food pyramid' given in Figures 6.2 and 6.3. These figures are applicable for adult man and woman. The number of portions (servings) can be adapted for various physiological groups. By comparison, one can know whether a person is consuming a normal/ recommended diet or not.

The amount of intake indicates clearly whether a person has normal nutritional status or not. Let us know the method of determining your nutritional status -

- (i) Note down whatever food items are eaten on one particular day along with the amounts of raw food items, in grams.
- (ii) Now group the food items into different food groups and find out the respective total amounts.
- (iii) Lastly, compare the differences in amounts of each food group with the recommended dietary intakes for the age and sex.

The dietary intakes similar to the recommended dietary intakes will mean a normal nutritional status.

You can assess the nutritional status of any one by determining their dietary intakes in a similar way and compare their intakes with those recommended for their age and sex.

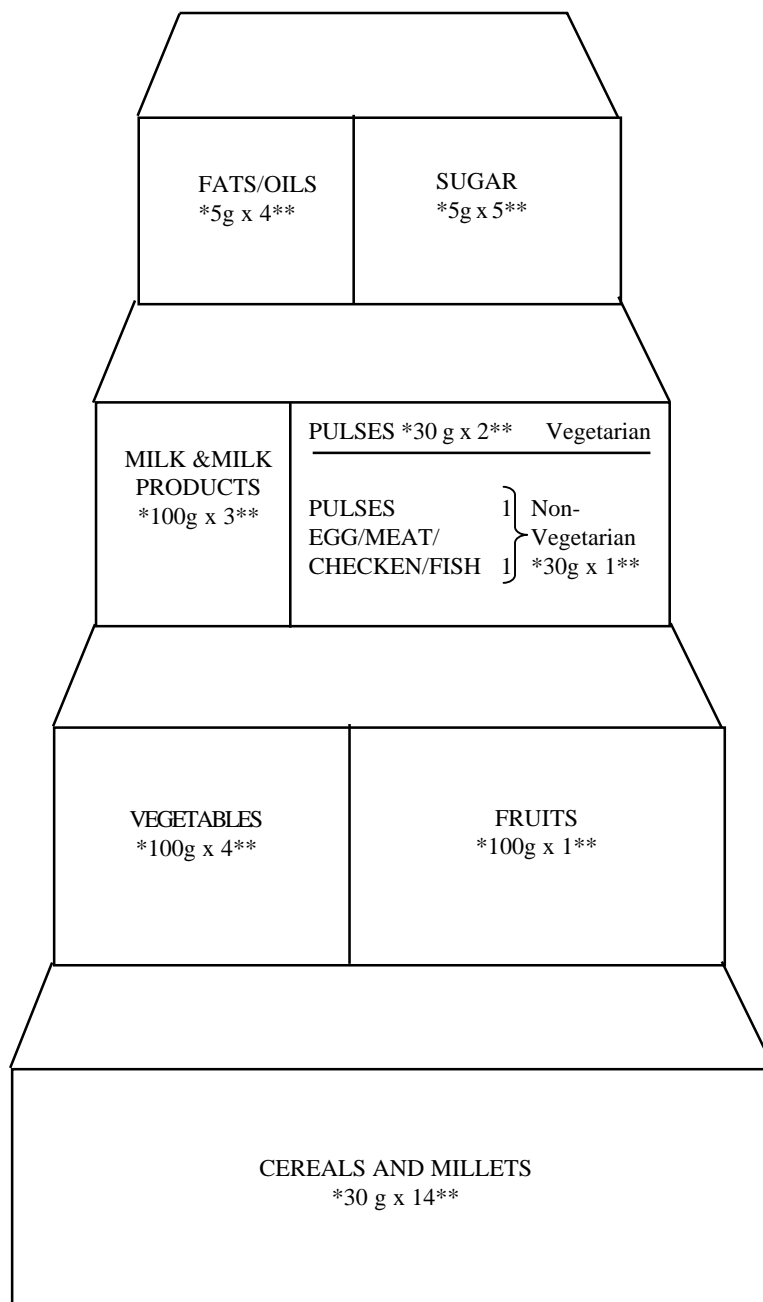


Activity 6.2: Maintain and note down all the food items that you have taken for a week and identify the main nutrient present in them.

Days of the week	Breakfast		Lunch		Evening Tea		Dinner	
	Food item	Nutrient	Food item	Nutrient	Food item	Nutrient	Food item	Nutrient
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								
Sunday								



Notes



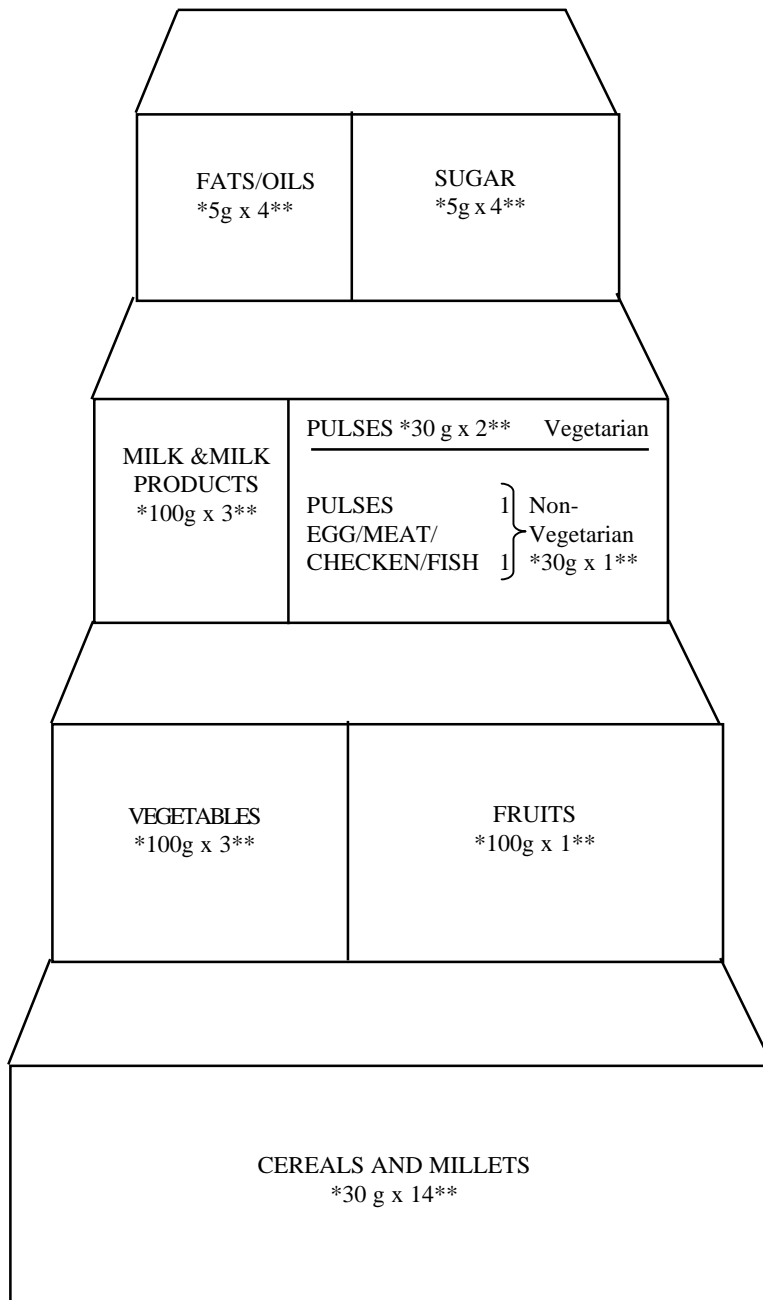
* Portion Size ** No. of Portions

Elderly man : Reduce 3 portions of cereals and millets and add an extra serving of fruit.

Fig. 6.3 : Balanced diet for adult man (sedentary)



Notes



* Portion Size ** No. of Portions

Extra Portions:

Pregnant women : Fat/Oil-2, Milk-2, Fruit-1, Green Leafy Vegetables-1/2

Lactating women : Cereals-1, Pulse-1, Fat/Oil-2, Milk-2, Fruit-1, Green Leafy Vegetables-1/2

Between 6-12 months of lactation, diet intake should be gradually brought back to normal.

Elderly women: Fruit-1, reduce cereals and millets-2

Fig. 6.4 : Balanced diet for adult woman (sedentary)



3. Recognising Nutritional Deficiency Diseases

You can also assess the nutritional status of a person by observing the signs and symptoms of various nutritional deficiency diseases. The presence of one or more deficiencies will mean poor nutritional status.

You have already read that when the nutrients provided in the diet are either consumed below the required levels or are not properly utilised by the body, it results in the state of nutritional imbalance. This leads to “nutritional deficiency” in the body.

For example, vitamin A is important for normal vision in dim light. If your diet does not provide sufficient vitamin A, it will lead to vitamin A deficiency in your body. It will affect the normal functioning of your eyes, for example, you will not be able to see in the dark (night blindness), your eyes will lose clarity and may become cloudy/muddy.

Similarly, you will see that the child suffering from protein and energy malnutrition is shorter and thinner as compared to the other children of same age eating sufficient energy and proteins in their diets. Such physical differences are indicative of a nutritional deficiency disease. These are usually specific and are, therefore, helpful in recognising different deficiency diseases in and around you.

6.4 NUTRITIONAL DEFICIENCY DISEASES

How will you recognise a nutritional deficiency disease? What are the consequences of deficiency diseases? Let us discuss these diseases one by one.

1. Protein Energy Malnutrition (PEM)

PEM is one of the major nutritional problems in our country. It can occur at any age, but it mainly affects the young children. It results due to:

- lack of energy and proteins
- lack of proteins alone in the diet.

You may ask how are protein and energy deficiencies related? Actually, energy deficiency can cause protein deficiency. Let us see how this happens:

The body gets energy from carbohydrates and fats. When these are not present in adequate amounts in the diet, the body cannot meet its energy needs. It then uses proteins for the supply of energy thereby resulting in deficiency of proteins in the body, hence PEM.

Low energy (carbohydrates and fats) intake
↓ leads to
Deficiency of energy in the body



Notes

↓ leads to
Use of proteins for giving energy because the availability of carbohydrates is low

↓ leads to
Deficiency of proteins in the body

Protein energy malnutrition is of two types:

1. Marasmus
2. Kwashiorkor

Growth retardation and decrease in amount of muscle are seen in both marasmus as well as kwashiorkor. Can you say why? Yes, you are right. Food that these children eat is deficient in energy foods and proteins are used for providing energy.

Table 6.2
Differences between Marasmus and Kwashiorkor

Marasmus	Kwashiorkor
Causes Deficiency of both energy and proteins	Deficiency of proteins alone
Age group Before 12 months of age	Young children between 1-3 years of age
Signs and symptoms Loose and wrinkled skin due to loss of fat beneath the skin	Oedema/swelling due to water accumulation in the body especially on face, arms and legs
Shrunken abdomen	Pot belly
Hunger	Loss of appetite
Diarrhoea (often)	Skin rash which tends to peel off
	Light coloured hair which are easy to pull
	Liver enlargement



Fig. 6.5



Fig. 6.6

These are the extreme forms of PEM. They can even lead to death. The milder forms of PEM are much more common and are associated with infections and other nutrient deficiencies.



2. Vitamin A Deficiency

The lack of vitamin A in the diet leads to vitamin A deficiency.

Signs and symptoms

- (i) Eye changes begin with night blindness, that is, inability to see when it is dark. If it is not treated, it leads to complete blindness.
- (ii) Drying of the white portion of the eye.
- (iii) Increased rate of infections especially of the respiratory system.

3. Anaemia

Anaemia means low level of haemoglobin in the blood. Haemoglobin is the red pigment in the blood and it helps in carrying oxygen to different parts of the body. Haemoglobin level decreases when iron is deficient in the diet. In other words anaemia is caused due to deficiency of iron. Anaemia can also be caused when there is lack of folic acid and vitamin B₁₂ in the diet.

Signs and symptoms

- (i) General body weakness. The person complains of tiredness and breathlessness.
- (ii) Loss of appetite.
- (iii) Paleness of tongue, white portion of eye and nail beds.
- (iv) Feeling of being pricked with pins and needles on the fingers and toes.
- (v) Brittle and spoon shaped nails.
- (vi) The capacity of a person to work decreases considerably.

4. Iodine Deficiency

Iodine is an important component of thyroxine hormone. This hormone controls most of the metabolic processes of the body.

Iodine deficiency is most commonly seen as goitre in adults and cretinism in young children. Iodine deficiency during pregnancy is harmful both for the mother and child. However, you must remember that these are not the only problems of iodine deficiency disorders (IDD).

Signs and symptoms

In adults

- (i) The neck becomes swollen. This is called goitre.
- (ii) The person may become fat.
- (iii) The person feels tired and is unable to work properly.
- (v) Skin changes may also occur.

In young children

- (i) Growth retardation



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- (ii) Mental retardation
- (iii) Speech and hearing defects
- (iv) Disorders of nerves and muscles causing inability to control movements of limbs.



Activity 6.3

Visit your neighbourhood. Do the following:

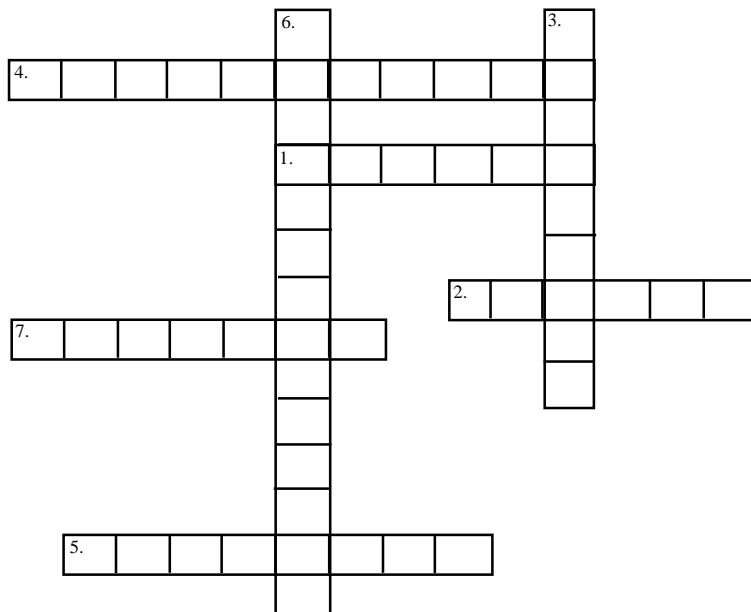
- (i) Look for the signs and symptoms of the deficiencies you have studied here in any 5 people around you.
- (ii) Identify the nutritional deficiency diseases they are suffering from. List your observations in the table given below.

S.No	Signs and Symptoms	Deficiency



INTEXT QUESTIONS 6.3

Fill in the crossword puzzle using the clues given below -





- i) Physical growth can be determined by measuring _____ and _____. (1, 2 across).
- ii) IDD is seen in the form of _____ in young children. (3 down)
- iii) Two forms of PEM are _____ and _____. (4, 5 across).
- iv) _____ is a symptom of vitamin A deficiency. (6 down).
- v) Low level of haemoglobin means _____. (7 across).

6.5 NATIONAL NUTRITION PROGRAMMES

The prevalence of the nutritional deficiency diseases is widespread in our country. You know that these diseases have serious ill-effects on the health and survival of the people. Also, you must know that with little care these diseases can be avoided. In order to control this situation, several National Nutrition Programmes have been launched in our country. These programmes provide nutritional benefits to susceptible groups. Do you know who are most susceptible to the problems of deficiencies? Yes, young children, adolescents, pregnant women and lactating mothers.

Let us now read about some of the important national nutrition programmes. By knowing the services provided, you can benefit yourself as well as others from these nutrition programmes.

1. Integrated Child Development Services (ICDS) Scheme
2. Mid Day Meal Programme (MDMP)
3. National Control Programme for Prevention of Nutritional Blindness due to Vitamin A deficiency
4. National Nutritional Anaemia Control Programme (NNACP)
5. National Iodine Deficiency Disorder Control Programme (NIDDCP)

1. Integrated Child Development Services (ICDS) Scheme

You know that children of today are future of tomorrow. If we take proper care of them, they will grow into healthy adults.

Imagine, if children do not get enough to eat then they will not be healthy. An unhealthy child will not be interested in studying. Similarly, if a child is suffering from diarrhoea, supplementary feeding will not be beneficial and it will not lead to improvement in the nutritional status of the child. Therefore, it is important to provide nutrition, health care and education together as a complete package of services. It is for this reason that ICDS programme was launched in our country. It has been successful because all the components essential for growth and development of children are included in it.

**ICDS package provides:****Health**

- Immunization
- Health check-ups
- Referral services
- Treatment of minor illnesses

Nutrition

- Supplementary feeding
- Growth monitoring and promotion
- Nutrition and Health Education (NHE)

Early Childhood Care Pre-School Education

- To children in the age group of 3-6 years

Convergence

- Of other supportive services, such as safe drinking water, environmental sanitation, women's empowerment programmes, non-formal preschool education and adult literacy.

The services under the ICDS scheme are provided at centres called **Anganwadis**. The health services are provided at the **Child Health Centres (CHC)**. Have you ever visited a CHC (formerly called Primary Health Centre or PHC) in your area? If yes, you must have seen that besides providing health services like immunization, health check-up, treatment of minor illness, the CHCs also provide referral services. Referral services mean that if a person is suffering from 'a serious health problem, he/she is referred to a bigger hospital for medical treatment'.

Beneficiaries

- Children below 6 years of age
- Adolescent girls between 11 and 18 years
- Pregnant women and lactating mothers
- All women between 15 and 45 years

2. Mid day Meal Programme (MDMP)

The main aim of MDM programme is to provide supplementary meal to primary school children between 6 and 11 years of age. This in turn ensures school attendance.

3. National Control Programme for Prevention of Nutritional Blindness Due to Vitamin A deficiency

This programme aims at preventing blindness due to vitamin A deficiency.



The services provided under this programme include:

- (i) Promoting consumption of vitamin A rich foods
- (ii) Providing massive doses of vitamin A orally to children between 6 months to 5 years of age.

Beneficiaries

- Children between 6 months to 5 years of age
- Pregnant women and lactating mothers
- All women between 15 and 45 years

4 National Nutritional Anaemia Control Programme (NNACP)

This programme aims at significantly decreasing the prevalence and incidence of anaemia in young children and women.

The services provided through this programme are :

- (i) Promotion of regular consumption of foods rich in iron
- (ii) Providing iron and folic acid supplements
- (iii) Treatment of severe anaemic cases.

Beneficiaries

- Children between 6 months to 5 years of age
- Pregnant women and lactating mothers
- All women between 15 and 45 years

5. National Iodine Deficiency Disorder Control Programme (NIDDCP)

The aim of this programme is to decrease the prevalence of Iodine deficiency disorder (IDD) in our country by providing iodine in the common salt (iodized salt).

The services provided are:

- (i) To assess the extent of the problem
- (ii) To arrange for production/supply of iodized salt
- (iii) To take quality control measures in order to ensure supply of standard quality of iodized salt to the consumer

The government is ensuring that all the salt that is produced in our country is iodized before it reaches the consumer. Steps are also taken to make the people aware about the consumption of iodized salt.



Notes



Activity 6.4: Find out from your health centre about the nutritional programmes operating in your area and what you can do to help yourself and other people to benefit from them.



Activity 6.5: Can you think and note down the name of popular brands of iodised salt which you have seen or heard about from T.V. magazines, markets etc.

Nutrition programme	Services	Beneficiaries	How can you help



INTEXT QUESTIONS 6.4

1. Indicate whether the following statements are true or false. Justify your answer.
 - (i) The only beneficiaries of the ICDS programme are children below 5 years of age.
.....
 - (ii) National IDD control programme aims to decrease the prevalence of night blindness in our country.
.....
 - (iii) Massive doses of vitamin A are given orally to children below 6 months of age.
.....
 - (iv) Iron and folic acid supplements are given to prevent anaemia.
.....

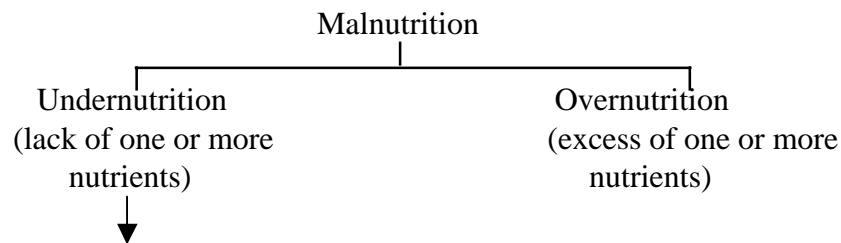
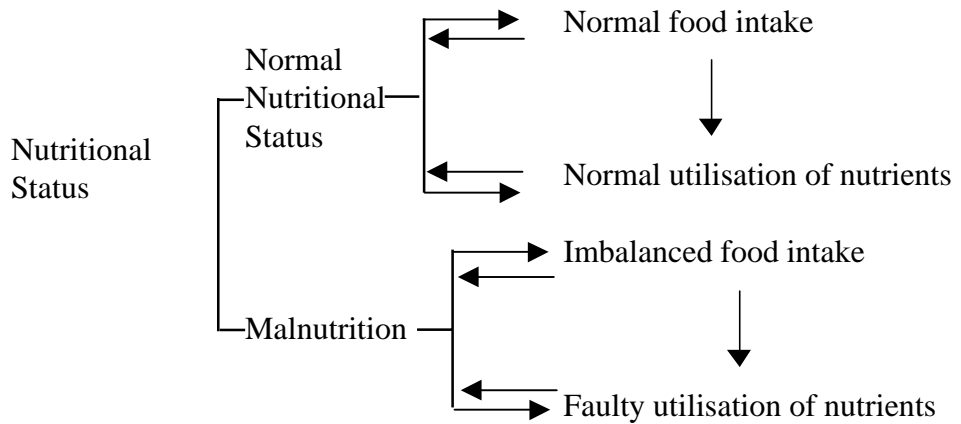
2. Rearrange the jumbled words to find out the names of ongoing major nutrition programmes of our country.
 - (i) D C S I _____
 - (ii) P M D M _____
 - (iii) P C N D I D _____
 - (iv) P N A N C _____



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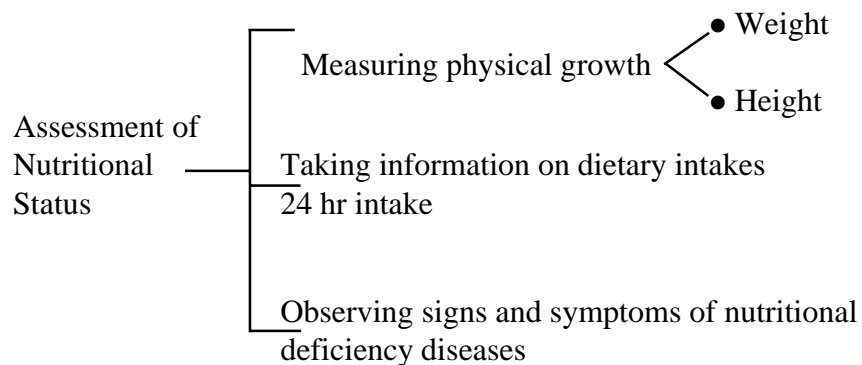


WHAT YOU HAVE LEARNT



Causes of Malnutrition :

- Decreased availability of food
- Increasing population
- Ignorance
- Poverty
- Poor personal hygiene and environmental sanitation
- Stress conditions





TERMINAL QUESTIONS

1. What do you mean by nutritional status? Discuss.
2. Describe the various methods of assessing nutritional status of a person.
3. Make a list some of the common nutritional deficiency diseases. State signs and symptoms of each.
4. Explain the importance of National Nutrition Programmes. Give the services and beneficiaries of five important National Nutrition Programmes in our country.



Notes

Name of the programme	Services	Beneficiaries

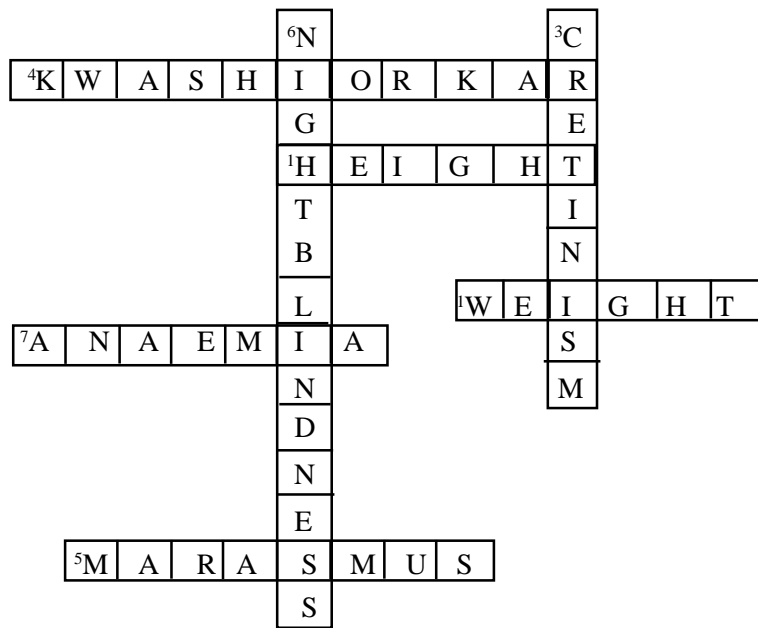


ANSWERS TO INTEXT QUESTIONS

- 6.1**
1. The condition of health of a person that is influenced by the intake and utilisation of nutrients is called nutritional status.
 2. (i) undernutrition, overnutrition
(ii) deficiency
(iii) obese
(iv) normal
- 6.2.**
1.
 1. Decreased availability of food
 2. Poverty
 3. Ignorance
 4. Less intake during pregnancy and lactation
 5. Infection
 6. Lower production of food
 2. death
 3. poor physical growth, mental growth, physical handicaps, deaths.



Notes



- 6.4.1** 1. (i) False, ICDS scheme benefits not only children but adolescents, pregnant and lactating women and all women between 15-45 years of age.
- (ii) False, The aim is to prevent Iodine deficiency disorder.
- (iii) False, beneficiaries are children from 6 months to 5 years of age.
- (iv) True, these are especially for pregnant and lactating women and all women in the age group of 15-45 years.
2. (i) ICDS (ii) MDMP (iii) NIDDCP (iv) NNACP

AUDIO

VIDEO - Our Food

*For more information log on to
<http://www.llu/nutrition/vegguide.html#food>*