Malnutrition is a disease that occurs when a person's diet lacks a sufficient amount of one or more nutrients. This involves foods that are either deficient in nutrients or too rich in nutrients, resulting in health issues. Calories, protein, carbohydrates, fat, vitamins, and minerals are some of the nutrients involved.

Severe Acute Malnutrition(SAM) and Moderate Acute Malnutrition(MAM) are the two forms of malnutrition. SAM applies to children who are severely malnourished.

Malnourished people are prone to diseases and are often cold. The signs and symptoms of micronutrient deficiencies vary depending on which micronutrient is deficient.

malnutrition include (1, 2):

- **Undernutrition:** This type of malnutrition results from not getting enough protein, calories or micronutrients. It leads to low weight-for-height (wasting), height-for-age (stunting) and weight-for-age (underweight).
- **Overnutrition:** Overconsumption of certain nutrients, such as protein, calories or fat, can also lead to malnutrition. This usually results in overweight or obesity.

People who are undernourished often have deficiencies in vitamins and minerals, especially iron, zinc, vitamin A and iodine (3).

However, micronutrient deficiencies can also occur with overnutrition.

It's possible to be overweight or obese from excessive calorie consumption but not get enough vitamins and minerals at the same time.

That's because foods that contribute to overnutrition, such as fried and sugary foods, tend to be high in calories and fat but low in other nutrients (4).

types of Malnutrition

The 4 different types of Malnutrition are given below

Growth Failure Malnutrition – The growth of an individual in stature or weight, is not commensurate with the age and gender.

Acute Malnutrition or Wasting – There are 3 different types under this category.

Marasmus – In this type, due to lack of nutrients in the body, the tissues and body fat starts degenerating at an alarming rate. It also affects the immune system of the body.

Kwashiorkor – In this type, an under-nourished child looks very plump. This happens due to retention of fluid in the legs.

Marasmic-Kwashiorkor, this happens due to oedema and severe wasting.

Chronic malnutrition or Stunting – This can be prevented by providing proper medical treatment to pregnant women and also making sure that adequate quantities of nutrients are available. Stunting happens due to poor maternal health and it is very risky since it cannot be reversed after a certain age.

Micronutrient Malnutrition – This happens due to deficiency of iron (causes anaemia, effects brain and hear), iodine deficiency (creates problems in thyroid functioning), Zinc deficiency (creates anaemia, affects the sensory perception, poor immunity), Selenium deficiency (reduces immunity), deficiency of Vitamin A (poor bone development, vision), deficiency of Vitamin D (problems in bone development, causes rickets), deficiency of Vitamin B9 or Folate (causes anaemia and slow growth).

Signs and Symptoms

The signs and symptoms of malnutrition depend on the type.

Being able to recognize the effects of malnutrition can help people and healthcare providers identify and treat issues related to under- or overnutrition.

Undernutrition

Undernutrition typically results from not getting enough nutrients in your diet.

This can cause (5):

- Weight loss
- Loss of fat and muscle mass
- Hollow cheeks and sunken eyes
- A swollen stomach
- Dry hair and skin
- Delayed wound healing
- Fatigue
- Difficulty concentrating
- Irritability
- Depression and anxiety

People with undernutrition may have one or several of these symptoms. Some types of undernutrition have signature effects.

Kwashiorkor, a severe protein deficiency, causes fluid retention and a protruding abdomen. On the other hand, the condition marasmus, which results from severe calorie deficiency, leads to wasting and significant fat and muscle loss (5).

Undernutrition can also result in micronutrient deficiencies. Some of the most common deficiencies and their symptoms include (3):

- **Vitamin A:** Dry eyes, night blindness, increased risk of infection (6).
- **Zinc:** Loss of appetite, stunted growth, delayed healing of wounds, hair loss, diarrhea (7).
- **Iron:** Impaired brain function, issues with regulating body temperature, stomach problems (8).

- **Iodine:** Enlarged thyroid glands (goiters), decreased production of thyroid hormone, growth and development issues

Since undernutrition leads to serious physical issues and health problems, it can increase your risk of death.

In fact, it's estimated that stunting, wasting and zinc and vitamin A deficiencies contributed to up to 45% of all child deaths in 2011

Overnutrition

The main signs of overnutrition are overweight and obesity, but it can also lead to nutrient deficiencies.

Research shows that people who are overweight or obese are more likely to have inadequate intakes and low blood levels of certain vitamins and minerals compared to those who are at a normal weight

Overnutrition

Overnutrition is another type of malnutrition. It occurs when a person takes in more nutrients than they need. The result may be an accumulation of body fat from the excess nutrients, resulting in overweight or obesity.

Overnutrition has several health implications. People who have overweight or obesity are at greater risk of:

- heart disease
- high blood pressure
- diabetes
- cancer
- high cholesterol

Common Causes of Malnutrition

Malnutrition is a worldwide problem that can result from environmental, economic and medical conditions.

The WHO estimates that over 460 million adults and 150 million children are undernourished, while more than two billion adults and children are overweight or obese

Dietary Practices

Undernutrition: Malnutrition in babies and children is linked to the deaths of an estimated one million children per year due to a lack of sufficient breastfeeding. Illegal marketing of breast milk substitutes led to malnutrition and persisted three decades after the WHO International Code of Marketing Breast Milk Substitutes prohibited it in 1981. Maternal malnutrition may also contribute to a baby's poor health or death. Defective development of the foetus in the mother's womb has resulted in over 800,000 neonatal deaths.

Overnutrition: Overeating causes overnutrition, which is a form of malnutrition. More than half of all adults in the United States are now overweight, a condition that, like malnutrition, raises the risk of illness and injury, decreases worker productivity, and shortens life expectancy. Overeating is much more popular in the United States, where food is readily available to the majority of people. In addition to increased sedentary lifestyles, many parts of the world have access to an abundance of non-nutritious food. This is a "toxic food world," according to Yale psychologist Kelly Brownell, in which fat- and sugar-laden foods have taken precedence over organic, nutritious foods.

Poverty and Food Prices

Poor socioeconomic status has been linked to chronic malnutrition in Bangladesh because it prevents the purchasing of nutritious foods like milk, meat, poultry, and fruits. Although food shortages play a role in malnutrition in countries where technology is lacking, the FAO estimates that eighty percent of malnourished children in the developing world live in countries where food surpluses are generated.

Agricultural Productivity

Local food shortages can be caused by a lack of arable land, bad weather, poor farming skills such as crop rotation, or a lack of technology or resources such as fertilisers, pesticides, irrigation, machinery, and storage facilities that are needed for higher yields in modern agriculture. Farmers cannot afford or governments cannot provide the resources needed to increase local yields as a result of widespread poverty. In the name of free market policies, the World Bank and some wealthy donor countries push countries that depend on aid to slash or remove subsidised agricultural inputs like fertiliser, even as the US and Europe heavily subsidised their own farmers.

- **People with issues that affect nutrient absorption:** People with Crohn's disease or ulcerative colitis may be up to four times more likely to have malnutrition than those without these conditions

If the body does not absorb nutrients efficiently, even a healthful diet may not prevent malnutrition.

Examples of digestive and stomach conditions that may cause this include:

- Crohn's disease
- ulcerative colitis
- celiac disease
- persistent diarrhea, vomiting, or both

Low intake of food

Some people develop malnutrition because there is not enough food available, or because they have difficulty eating or absorbing nutrients.

This can happen as a result of:

- cancer
- liver disease
- conditions that cause nausea or make it difficult to eat or swallow
- taking medications that make eating difficult — due to nausea, for example

Mouth problems such as poorly fitting dentures may also contribute to malnutrition.

Mental health conditions

Undernutrition or malnutrition can affect people with:

- depression
- dementia
- schizophrenia
- anorexia nervosa

Alcohol use disorder

Consuming a lot of alcohol can lead to gastritis or long-term damage to the pancreas. These issues can make it hard to:

- digest food
- absorb vitamins
- produce hormones that regulate metabolism

Alcohol also contains calories, so a person may not feel hungry after drinking it. They may, therefore, not eat enough healthful food to supply the body with essential nutrients.

Social and mobility problems

Factors that can affect a person's eating habits and potentially lead to malnutrition include:

- being unable to leave the house or go to a store to buy food
- finding it physically difficult to prepare meals
- living alone, which can affect a person's motivation to cook and eat
- having limited cooking skills
- not having enough money to spend on food

- **Inability to obtain and prepare foods:** Studies have identified being frail, having poor mobility and lacking muscle strength as risk factors for malnutrition. These issues impair food preparation skills (37, 38).

. Malnutrition Diseases:

Malnutrition may be caused by a variety of health problems, including gastroenteritis or chronic disease, such as the HIV/AIDS epidemic.

Malnutrition can be caused by diarrhoea and other infections because of decreased nutrient absorption, decreased food intake, increased metabolic requirements, and direct nutrient loss.

Malnutrition can also be caused by parasitic infections, especially intestinal worm infections (helminthiasis).

Lack of sanitation and hygiene is a leading cause of diarrhoea and intestinal worm infections in children in developing countries.

People may become malnourished as a result of nutritional loss that is abnormal (due to diarrhoea or chronic illness affecting the small bowel).

Crohn's disease or untreated coeliac disease are examples of these disorders. Increased energy expenditure can also lead to malnutrition (secondary malnutrition).

Treatment of Malnutrition

If a doctor determines that an individual is malnourished, they will devise a treatment plan for them. A nutritionist and other healthcare professionals may be required to meet with the person.

The seriousness of the malnutrition, as well as the involvement of any other underlying disorders or complications, will determine the course of treatment.

It may contain the following:

- Continuous screening and testing.
- Developing a nutritional schedule, which may require supplementation.
- Treating specific symptoms including nausea.
- Testing for any mouth or swallowing issues.
- Treating any infections that might be present.
- Recommending different feeding utensils.

In extreme circumstances, an individual may be required to:

- Spend time in the hospital.
- Progressively begin to take in nutrients over a period of days.
- Intravenously obtain nutrients such as potassium and calcium.

Prevention

Government agencies, independent organizations and schools can play a role in preventing malnutrition.

Research suggests that some of the most effective ways to prevent malnutrition include providing iron, zinc and iodine pills, food supplements and nutrition education to populations at risk of undernutrition

In addition, interventions that encourage healthy food choices and physical activity for children and adults at risk of overnutrition may help prevent overweight and obesity

Eating a safe, nutritious diet is the best way to avoid malnutrition.

You can consume a wide range of foods from each of the major food groups, including:

- Fruit and vegetables in abundance.
- Bread, rice, potatoes, pasta, and other starchy foods.
- Non-dairy alternatives to milk and dairy foods.
- Meat, fish, eggs, and beans are some protein-rich foods.

Older adults, young children, people with serious or chronic illness, and others may need special attention to get the nutrients they need.

Malnutrition in India – Schemes Launched by Government of India

The Government of India had launched multiple schemes to address the problems of the high rate of malnutrition in India.

Below tables give details on the Government of India schemes to address malnutrition

Schemes	Details of the scheme
Integrated Child Development Scheme	1. Launched in 1975 2. The target group of this scheme is women and children below 6 years of age. 3. This scheme is implemented by the Ministry of Women and Child Development. 4. This program entails providing nutrition, medical health check-up, immunization.
National Nutrition Policy	1. It was launched in 1993. 2. It was launched by the Ministry of Women and Child Development
Mid Day Meal Scheme	1. Launched in 1995 2. The target group of this scheme is children aged between 6 years to 14 years.

National Nutrition Policy	1. It was launched in 1993 2. The objective of this mission was to achieve optimum nutrition for all.
National Health Mission	1. This mission was launched in the year 2013. 2. This mission absorbed 2 other missions – National Rural Health Mission and National Urban Health Mission 3. This mission is implemented by the Ministry of Health and Family Welfare

Indira Gandhi Matritva Sahyog Yojna	1. The scheme is implemented by the Ministry of Women and Child Development 2. This mission focuses on providing cash incentives to pregnant and lactating mothers

National Nutrition Mission	1. This Mission is also called POSHAN Abhiyaan 2. The objective of this mission is to make India free of malnutrition by 2022. 3. The target groups of this mission are pregnant and lactating mothers, children and adolescents 4. Aim to reduce undernutrition by 2%, low birth weight by 2% and anaemia by 3%. 5. By 2022, the objective is to reduce the proportion of stunted children in the population to 25%