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# Introductory Chapter: Malnutrition

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## 1. Introduction

Malnutrition is defined as not having enough food to eat or more than feeling hungry. Insufficient intake of calories (a measure of energy the body needs), protein (necessary to build muscle and to keep the body healthy), iron (for appropriate blood cell function) as well as different types of nutrients can cause malnutrition [1]. In a person's intake of energy as well as nutrient imbalances, excesses or deficiencies are referred to as malnutrition. Two broad groups of conditions are covered by the term malnutrition. One is 'undernutrition' which comprises micronutrient deficiencies or insufficiencies (a lack of significant vitamins and minerals), underweight (low weight for age), wasting (low weight for height), as well as stunting (low height for age) [2].

Among the children fundamental cause of mortality and morbidity is malnutrition [3]. Approximately half of the mortality in children attributed to undernutrition around the globe [4]. In children's mental and physical development, it poses a risk as well that is result in deprived academic accomplishment [5]. To ensure in early childhood intellectual development, proper physical and a strong immune system adequate nutrition is indispensable [6, 7]. In the world under the age of five 110 million (19%) are moderately or severely underweight and 170 million (30%) of children are moderately or severely stunted [8]. In Asia reside approximately half of all stunted children, under five years of age children 51 million (8%) are wasted, as well as in Asia live two thirds of all wasted children [9]. The dynamic prospective of the society, socioeconomic development of children and future health affects by malnutrition. Prevalence of child malnutrition compared to other developing countries Pakistan has been reported to have one of the highest levels [10]. About 50% were anemic, 44% were stunted, 33% were anemic (iron deficiency), 33% of all children were underweight, 15% are wasted, According to the National Nutrition Survey. In Pakistan compared to other developing countries in the prevalence of child malnutrition there has been a little reduction, In the last two decades [11]. In less developed countries a major public health and social problem, childhood malnutrition still remains, despite economic and social development [12, 13]. In childhood malnutrition the contributing factors are infectious diseases, vaccination, poor sanitation, food insecurity, household socioeconomic status, birth spacing, parity, micronutrient intake, lack of proper knowledge of nutrition, maternal education, inappropriate complementary feeding, inadequate breast feeding and exclusive breastfeeding as well as low birth weight. In the world the Pakistan is among the countries with the highest rates of child malnutrition, as well as than in other South Asian countries its progress and health in child nutrition remains slower.

## 2. Undernutrition

If undernutrition occurs before two years of age or during pregnancy, it may result in permanent problems with mental and physical development. Known as starvation, the extreme undernourishment, may have symptoms that comprise swollen legs and abdomen, very poor energy levels, thin body and a short height. Frequently cold and infections too often get people. On the micronutrient that is lacking depend the symptoms of micronutrient deficiencies. Not enough high-quality food being available to eat most often undernourishment is because of it. Most often related to poverty as well as high food prices. Be short of breastfeeding might contribute as might a number of infectious diseases for instance measles, malaria, pneumonia as well as gastroenteritis which enhance nutrient requirements. Dietary deficiencies as well as protein-energy malnutrition, there are two main types of undernutrition. A lack of vitamin A, iron and iodine comprises common micronutrient deficiencies. Deficiencies may become more common, due to the body's increased need, during pregnancy. Two severe forms of Protein-energy malnutrition are kwashiorkor (a lack of just protein) and marasmus (a lack of protein and calories). Within the same communities as undernutrition is beginning to present overnutrition in the form of obesity, in some developing countries. Malnutrition other causes comprise bariatric surgery and anorexia nervosa [14].

## 3. Wasted and stunted

In two major ways nutritionists have categorized undernutrition, Since the 1970s. If children have a small mid-upper arm circumference and low weight for-height, to signify acute undernutrition which is taken, they are defined as wasted and in need of treatment. If children have a low height-for-age, to signify chronic undernutrition which is taken they are defined as stunted. Low weight-for-age classified children as underweight, because of stunting or wasting or both thus, undernutrition index is composite. At the population level widely used these markers to assess child undernutrition as well as who are wasted or stunted a high prevalence of children is considered a public health problem [15]. At the level of interventions and programmatic design, however, the two categories of undernutrition were approached very differently.

Wasted children contain an elevated risk of dying that by nutritional therapy may often rapidly reduced [16]. To prevent deaths associated with child wasting, making therapy available is so considered essential. On the other hand, including fetal development, over long periods children have poor growth in height they are categorized as stunted. For rapid nutritional correction is not willing this growth faltering as well as consequently rather than treatment considered to require prevention, these outcomes in terms of policy leading to the separation, programmed interventions, guidance as well as financing: at the individual level, now viewed as separate conditions acute undernutrition as well as chronic undernutrition, and among policy makers as distinct outcomes are routinely reported [17].

A new classification for malnutrition is established by John Conrad Water low. to show the stunting which results as of chronic malnutrition with height-for-age combines weight-for-height (representing acute episodes of malnutrition), rather than using just weight for age measurements, the classification established by Water low. Over the Gomez classification one advantage of the Water low classification is that even if ages are not known weight for height can be examined [18].

Degree of PEM	Stunting (%) height for age	Wasting (%) weight for height
Normal: Grade 0	>95%	>90%
Mild: Grade I	87.5–95%	80–90%
Moderate: Grade II	80–87.5%	70–80%
Severe: Grade III	<80%	<70%

The above table shows the classifications of malnutrition by WHO, with some modifications being commonly used.

4. The effects of malnutrition

More likely than others to be caught in the weakened immunity as well as downward spiral of malnutrition, people who restrict their food intakes, whether because of an eating disorder, illness, desire for weight loss, and lack of appetite. One or more of the following also susceptible: malnourished, poor, hospitalized and very young or old. When medical tests of a malnourished individual signify compromised immune system increase dramatically rate of death and sickness.

When an individual becomes malnourished, often worsens disease by malnutrition that in turn gets worse malnutrition. For disease when impaired immunity opens the way often begins a destructive cycle: when impairs appetite by disease, interferes with absorption as well as digestion, excretion increases or metabolism alter then further suffer nutrition status [19].

5. Effect of malnutrition on economy of a country

Malnutrition as well as global hunger remains big challenges in the last two decades, despite achieved significant progress. In the world about 805 million people continue to suffer as of chronic hunger and people suffer from micronutrient deficiencies more than 2 billion. Furthermore, in low and middle-income countries, obesity and overweight are on the rise.

Huge economic and social costs are imposed by hunger and malnutrition that are able to be felt at societal, household, and individual levels. For instance, according to the FAO, the global economy per year US\$1.4–2.1 trillion cost for hunger and undernutrition or global gross domestic product 2–3%. To eliminate hunger and malnutrition, the economic returns are able to as well extremely elevate. From reducing child undernutrition, there are substantial, lifetime economic benefits demonstrated by evidence as of IFPRI-led research. For instance, every dollar spent on interventions in economic returns to reduce stunting is estimated to generate about US\$34, in India.

Malnutrition as well as hunger is expensive. It is predictable that because of undernutrition (GDP) 2–3%, equivalent to per year US\$1.4–2.1 trillion is lost and because of overnutrition annual GDP another 2–3% is lost. Collectively, because of malnutrition global GDP 5% (per year US\$3.5 trillion) is lost [20].

Each dollar spent in economic benefits iodizing salt generates \$30; each dollar spent in economic benefits on iron supplements for children aged six to 24 months and for mothers generates \$24. Each dollar spent in economic benefits on vitamin A generates estimated to be \$40 or more. To reduce chronic undernutrition need bundling micronutrient interventions for instance, individuals that decrease iron, iodine and vitamin A deficiencies with the condition of other micronutrients (for

example to reduce the duration and severity of diarrhea zinc powders needed) as well as energy-dense foods. About the importance of these for healthy child growth communication with caregivers and mother is also important. Across countries the costs related with doing so differ as do the benefits however in a typical developing country, each dollar spent in economic benefits on this bundle generates around \$18.

These are extraordinarily high benefit: cost ratios, by the standards of economics. Not merely that, trivially low the costs of these investments. Who are vitamin A deficient in the 95 million preschool children to eliminate vitamin A deficiency from every North American and western European less than two dollars would be enough, investment of about \$650 million dollars a year an additional annual, as well combating undernutrition spent to current expenditures. Nearly two billion people are affecting by iodine deficiencies and 80 million pregnant women are affecting by anemia. Needed to reduce chronic undernutrition – for the bundle of interventions a larger investment is needed, suggest by current estimates that in the 34 countries per year around nine and half billion dollars would reach 90% of children that in the developing world account for 90% of the burden of undernutrition [21].

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