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## Obesity and malnutrition - two sides of a coin: A survey study

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### Abstract

Obesity in children and adolescents are rapidly reaching epidemic proportions globally as well as in India. It is a well-recognized risk factor for adult obesity, which in turn may be the basic of various chronic diseases. There for by preventing he development of obesity in childhood can reduce the likely hood of obesity in adulthood and its health consequences. Nearly one-third of the world is obese or overweight, leading to a rise in chronic diseases in developing countries. Combating the problem requires funding, innovation and an understanding of the link to undernutrition. Obesity and the chronic diseases often connected with being overweight, such as diabetes, used to be thought of as problems for high-income countries. In fact, they've become global issues, with 2.1 billion people – nearly 30 percent of the world's population – considered either obese or overweight. And according to the International Diabetes Federation, four out of every five people with diabetes now live in developing countries. The purpose of the survey study was to identify the various aspect, causes and the relation between obesity and malnutrition. On the basis of review and literature the following conclusions were made. Suggestions also underscore the importance of a nutrition-sensitive supply chain. It is important to identify the bottleneck at each point of the supply chain so that tailored actions can be implemented to target each distinct problem. Encouraging programs to promote physical activity is also a key potential intervention. Sustainable and inclusive economic growth, which aims to reduce income, educational, and gender inequality should be the key policy goal in a successful fight against food insecurity, hunger and malnutrition.

**Keywords:** Hunger and malnutrition, children and adolescents, adult obesity

### Introduction

When someone's diet contains an excess or imbalance of energy, protein and micronutrients, and that can lead to obesity, that form of malnutrition is overnutrition. Both undernutrition and overnutrition can be devastating to a nation's overall health and productivity. The impact of obesity on health is well documented: Being overweight makes people susceptible to an array of noncommunicable or chronic illnesses, including cardiovascular disease, type 2 diabetes and even some cancers. Over nutrition is leading middle- and low-income countries to join more affluent nations are calling a "pandemic of obesity." Many people in developing countries can't access or afford treatment for chronic diseases, and the costs to a nation's physical and economic health are potentially disastrous "Obese people move slower and are sick from work more often because of complications of diabetes and other noncommunicable diseases. "Tackling the rise in overweight and obesity in developing countries means understanding that overnutrition isn't necessarily about eating too much food, but about eating the wrong kinds of food. Increasing economic development and urbanization have led to changes in lifestyles around the world, including more sedentary work and a reliance on processed foods or meals cooked outside the home. Food systems have brought about an increase in the consumption of packaged and processed foods, many of which are calorie dense and nutrition deficient, as well as being high in fat, salt and sugar. According to WHO, the number of overweight or obese adolescents is also increasing everywhere. The impact on adolescent girls, as well as older women of reproductive age, can include a greater risk of gestational diabetes and later development of type II diabetes, pregnancy-induced hypertension and larger babies, which in turn increases the chance of induced labour.

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Obesity and undernutrition aren't simply two issues that developing countries have to address in parallel – they are linked in a way that has massive ramifications for the futures of those countries. Perhaps counterintuitively, children who start out life suffering from undernutrition often end up suffering from overnutrition and its effects. In low- and middle-income countries, poor nutrition is the cause of almost half of deaths in children under 5 every year. “Innovation in nutrition is needed.”. “We need more creativity in how food systems can provide higher-quality products. Governments play a bigger role in educating the public about the dangers of malnutrition and overnutrition.

### Causes of obesity & overweight

Several factors can play a role in gaining and retaining excess weight. These include diet, lack of exercise, environmental factors, and genetics.

**Food and Activity:** People gain weight when they eat more calories than they burn through activity. This imbalance is the greatest contributor to weight gain.

**Environment:** The world around us influences our ability to maintain a healthy weight. For example: Not having area parks, sidewalks, and affordable gyms makes it hard for people to be physically active. Oversized food portions increase Americans' calorie intake, making even more physical activity necessary to maintain a healthy weight. Some people don't have access to supermarkets that sell affordable healthy foods, such as fresh fruits and vegetables. Food advertising encourages people to buy unhealthy foods, such as high-fat snacks and sugary drinks are some examples.

**Genetics:** Research shows that genetics plays a role in obesity. Genes can directly cause obesity in such disorders as Prader-Willi syndrome. Genes also may contribute to a person's susceptibility to weight gain. Scientists believe that genes may increase a person's likelihood of having obesity but that outside factors, such as an abundant food supply or little physical activity, also may be required for a person to have excess weight.<sup>2</sup>

**Health Conditions and Medications:** Some hormone problems may cause overweight and obesity, such as underactive thyroid, Cushing syndrome and polycystic ovary syndrome. Certain medicines also may cause weight gain, including some corticosteroids, antidepressants, and seizure medicines.<sup>1</sup>

**Stress, Emotional Factors, and Poor Sleep** Some people eat more than usual when they are bored, angry, upset, or stressed. Studies also have found that the less people sleep, the more likely they are to have overweight or obesity. This is partly because hormones that are released during sleep help control appetite and the body's use of energy.

**Malnutrition:** Normal things like resisting disease and growth becomes difficult in a person having malnutrition. Learning abilities reduce and doing physical work is harder. Pregnancy has risks involved and breast milk might not be adequate or nourishing enough. Malnutrition chances increase if the food isn't adequate or nourishing enough. Even though the food might be sufficient to eat,

malnourishment might be there if the micronutrients (minerals and vitamins) aren't sufficient for the daily needs. Malnutrition and disease are linked closely. There are different types of malnutrition (a)Disease-related malnutrition arises due to reduced dietary intake, malabsorption, increased nutrient losses or altered metabolic demands Wide-ranging changes in physiological function occur in malnourished patients leading to increased rates of morbidity and mortality (b)This condition could cause harm to various essential organs and their functions in the human body. While the lack of ample nutrients causes improper growth, it could also cause rickets, organ failure and stunted growth. The common four types of malnutrition which a person might suffer from are as follows.

**Growth failure malnutrition:** When the growth of an individual is not as per the expectation and age then it come undergrowth failure malnutrition.

**Chronic malnutrition and stunting:** This condition takes a lot of time to occur. The consequences of the condition are also severe. This condition starts before a child is born due to improper maternal health.

**Micronutrient malnutrition:** This is a condition that develops due to lack of vitamins A, B, C, D, selenium, iodine, iron, zinc, folate, and calcium. For the various processes of the body, these micronutrients are of great importance. A healthy person can become malnourished if these things are deficient.

**Wasting or acute malnutrition:** This is a condition that occurs if there is a drastic weight or sudden weight loss. It is divided into three types:

- **Marasmus:** This condition occurs when the tissue and the body fat start decreasing at a very rapid pace. This happens to compensate for the lack of nutrients in the body.
- **Kwashiorkor:** In this condition, a child may have swollen limbs due to pitting oedema.
- **Marasmic-kwashiorkor:** This condition is a combination of both the above conditions.

**Some of the common causes of malnutrition are inclusive of the following:**

- Digestive problems along with issues of absorption of nutrients: disease such as bacterial overgrowth in the intestine, celiac disease, and Crohn's disease can lead to malnutrition.
- Excessive consumption of alcohol can lead to a person consuming fewer amounts of micronutrients, calories, and protein.
- Mental health disorders like depression can lead to an increased risk of malnutrition.
- Some of the studies have revealed that being frail, lacking muscle strength, and having poor mobility increases the risk of malnutrition.
- In both developed and developing countries lack access to sufficient food leads to the condition of malnutrition in the children.

### The best food for malnutrition

Given below is the list of top food products which are best for malnutrition:

- **Carbohydrates:** Consuming carbohydrates in a sufficient amount is very important. They help in the storage of the protein along with getting a sufficient amount of energy.
- **Vegetables and fruits:** A person suffering from the condition of malnutrition must take vitamins available from fresh vegetables and fruits.
- Protein is responsible for providing the body with the essential nitrogen which cannot be received from the lipids or carbohydrates. It is also very important for cell formation. It also improves the immune system.
- A person suffering from malnutrition must also include fats in the diet as they play an important role in maintaining healthy hair and skin. It also insulates the body from the shocks.
- Vitamins and minerals: these play a pivotal role in the body performing different functions. It not only promotes good health, but it also protects against several diseases and infections.
- Balanced diet: one of the best ways to prevent malnutrition is to consume a balanced diet with all the vitamins and minerals.
- Drinking plenty of water: keeping oneself hydrated also plays a vital role. A person should drink at least 8 glasses of water daily.
- Including food products that are a rich source of vitamin B-12 can be very beneficial for the person suffering from malnutrition.

### Malnutrition and obesity connections

Poverty and Obesity are Connected to Hunger and Food Insecurity. Poverty results in food insecurity and often hunger, which can lead to malnutrition. Furthermore, the absence of a diversified, nutrient-dense diet can lead to overnutrition, subsequent obesity, and failure to meet micronutrient requirements. Malnutrition is the lack of proper nutrition, caused by not having enough to eat, not enough of the right things, or not being able to use the food one eats. Obesity is linked to malnutrition in 3 main ways: Some People with obesity struggle to eat balanced foods. In some people with obesity, getting good nutrition can be a challenge. The increased availability of low-cost, high-calorie, nutrient-poor foods over the past four decades is a key component to the rise in obesity worldwide. Modern agriculture and food processing techniques lead to a relative reduction in the micronutrient content of common foods. Despite an excess of dietary calorie intake, obese individuals have relatively high rates of micronutrient deficiencies. The risk of type 2 diabetes is increased 4-fold in obese patients. Increased insulin resistance, incretin hormone resistance, oxidative stress, pancreatic  $\beta$ -cell dysfunction, and genetic and behavioural factors all contribute to the development of diabetes in obese individuals. Specific micronutrient deficiencies in obese individuals may also influence the development of type 2 diabetes. The physical impact of excess fat in people with the disease of obesity can make it hard for the body to absorb key nutrients such as vitamin D, chromium, biotin, and Thiamine.

**Vitamin D:** High rates of vitamin D insufficiency and frank deficiency have been reported in obese individuals and in diabetics. The prevalence of vitamin D in sufficiency While some controversy exists over treatment targets in individuals with mild insufficiency of vitamin D especially for the purported extra skeletal effects of vitamin D

supplementation, a significant amount of evidence suggests there may be some beneficial effect in using vitamin D supplementation for improvement in glucose metabolism and insulin signalling in patients with type 2 diabetes or impaired glucose tolerance. Recent reviews and meta-analyses of clinical trials suggest a potential effect of vitamin D supplementation on the development of type 2 diabetes in high-risk individuals

**Chromium:** Chromium deficiency in humans has been identified in severely malnourished patients who demonstrate severe insulin resistance, hyperglycaemia, hypertriglyceridemia, and painful neuropathy. The main dietary sources of chromium include yeast, meats, and wheat germ. The use of stainless-steel pots and utensils increases the chromium content of food as traces of chromium are liberated from the steel during preparation. Body stores of chromium are intracellular, mainly in the liver.

**Biotin:** is a water soluble vitamin that serves as a cofactor for carboxylase enzymes in fatty acid synthetic pathways, the citric acid cycle, and amino acid metabolism In addition to its biochemical function, circulating biotin regulates gene expression. A patients with type 2 diabetes demonstrate lower circulating levels of biotin compared to healthy controls and an inverse relationship between biotin level and fasting plasma glucose has been reported. Thiamine: is an essential micronutrient that acts as a cofactor for several key enzymes in glucose and amino acid metabolism including transketolase, pyruvate dehydrogenase,  $\alpha$ -ketoglutarate dehydrogenase, and  $\alpha$ -keto acid decarboxylase.

**Antioxidant Vitamins:** The high rate of vitamin C deficiency in obese individuals suggests that supplementation may be beneficial. Increasing dietary intake of fruits and vegetables can also address this deficiency and is currently recommended as part of a lifestyle intervention for the prevention and treatment of type 2 diabetes.

**Risk factors:** Medical problems. In some people, obesity can be traced to a medical cause, such as Prader-Willi syndrome, Cushing's syndrome and other conditions. Medical problems, such as arthritis, also can lead to decreased activity, which may result in weight gain.

### Conclusion

Follow a healthy diet plan with lots of fruits, vegetables, lean meats and dairy products, and whole grains, as nutrition and obesity are interrelated. Stop eating junk or processed foods, fatty and sugary foods. Exercise regularly. Use vegetable-based oil instead of animal-based fats. Get enough sleep because it helps reduce stress. Countries must start prioritising nutrition programs within their national budgets. Sustain global commitment, Progress towards reducing malnutrition will require a steadfast commitment from the international community, bring girls' health into focus, expand reach through community health workers, align other sectors with nutrition goals, devote funding to nutrition programs. It is also conclude that in obese patients, undernutrition and risk of malnutrition could be present at the same time. An involuntary weight loss more than 10% or reduction in caloric intake allowed to identify patients who, despite having excess weight, met the criteria for malnutrition or risk of malnutrition. Suggestions also

underscore the importance of a nutrition-sensitive supply chain. It is important to identify the bottleneck at each point of the supply chain so that tailored actions can be implemented to target each distinct problem. Encouraging programs to promote physical activity is also a key potential intervention. Sustainable and inclusive economic growth, which aims to reduce income, educational, and gender inequality should be the key policy goal in a successful fight against food insecurity, hunger and malnutrition.

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