



UNVEILING THE HIDDEN DYNAMICS: EXPLORING THE COMPLEX INTERPLAY OF SOCIOECONOMIC, DIETARY, AND ENVIRONMENTAL INFLUENCES ON THE RISING EPIDEMIC OF MALNUTRITION AMONG YOUNG CHILDREN

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Abstract: The investigation examines the numerous contributing factors to the alarming rise in infant malnutrition. Globally, malnutrition is a major health concern due to the intricate interaction between socioeconomic, dietary, and environmental factors. A holistic approach to address malnutrition is needed considering the complex interplay of these factors, according to the review. The paper provides a snapshot of the state of research on this topic and suggests possible strategies to curb the escalating trend of under-nutrition in infants and toddlers. The assessment emphasizes the urgent need for a comprehensive and encompassing approach to combat malnutrition and foster optimal child growth.

Key words: Malnutrition, socioeconomic, environmental, dietary factors, rising epidemic, young children, hidden dynamics, conceptual framework complex interplay.

INTRODUCTION

Malnutrition is a multifaceted issue affecting countless infants and toddlers around the globe. The issue of malnutrition has long been associated with poverty and underdevelopment, but recent research has revealed that it's actually more complicated than we initially thought. Malnutrition, a complex issue, has emerged as a major health concern, especially for infants and toddlers. The escalating epidemic of under-nutrition is not merely a result of inadequate nourishment but is also influenced by the intricate interaction of economic, dietary, and environmental variables. A lack or excess of nutrients can have a negative impact on health. Various circumstances can contribute to malnutrition, such as stifling economic circumstances, food scarcity, inability to obtain nutritious meals, and environmental influences like global warming. Malnutrition can have a significant impact on child growth and health, leading to stunted development, cognitive decline, weakened immune systems, and heightened vulnerability to ailments. The issue of under-nutrition among young children is a multifaceted one, and its alarming prevalence and devastating consequences have prompted increased attention in recent years. The World Health Organization estimates that malnutrition affects approximately 149 million children under the age of five, with the majority living in low- and middle-income countries (WHO, 2021). Socioeconomic, nutritional, and environmental factors are some of the factors that contribute to under-nutrition. The purpose of this review paper is to provide a thorough overview of the hidden forces that contribute to the escalating problem of under-nutrition in young

children, with a particular focus on the interactions between these elements. The paper also examined the existing literature, presented information, and offered suggestions for policy and intervention strategies to tackle this multifaceted issue.

Current State of Malnutrition Globally

The issue of malnutrition is a significant one that affects countless numbers of infants and toddlers around the globe. 144 million children under five years old are stunted, 45 million are underweight, and 34 million are obese, according to the World Health Organization. Malnutrition leads to stunting, affecting both physical and cognitive development. Children with stunted growth tend to have poor cognitive abilities, leading to lower academic performance and diminished earning potential as adults (Black et al., 2013). The incidence of nutritional deficiencies varies considerably by geographical location and financial standing. Malnutrition is a major public health concern in low-income countries, affecting over 20% of children under the age of five. In contrast, in countries with high per capita incomes, stunting in children is less prevalent, yet it still poses a significant threat to public health. Up to 10% of households with children are affected by food insecurity in high-income countries like the United States and the United Kingdom (Feeding America, 2021; Food Foundation & Child Poverty Action Group, 2018). A lack of regular access to enough food for a healthy lifestyle is called food insecurity (Feeding America, 2021). Lack of food resources can lead to poor eating habits and a higher chance of under-nutrition in children.

The figure below give a summary of the global state of Malnutrition among children under-5 affected by stunting at 144-million (65%), underweight 45-millions (20%) and overweight 34-millions (15%).

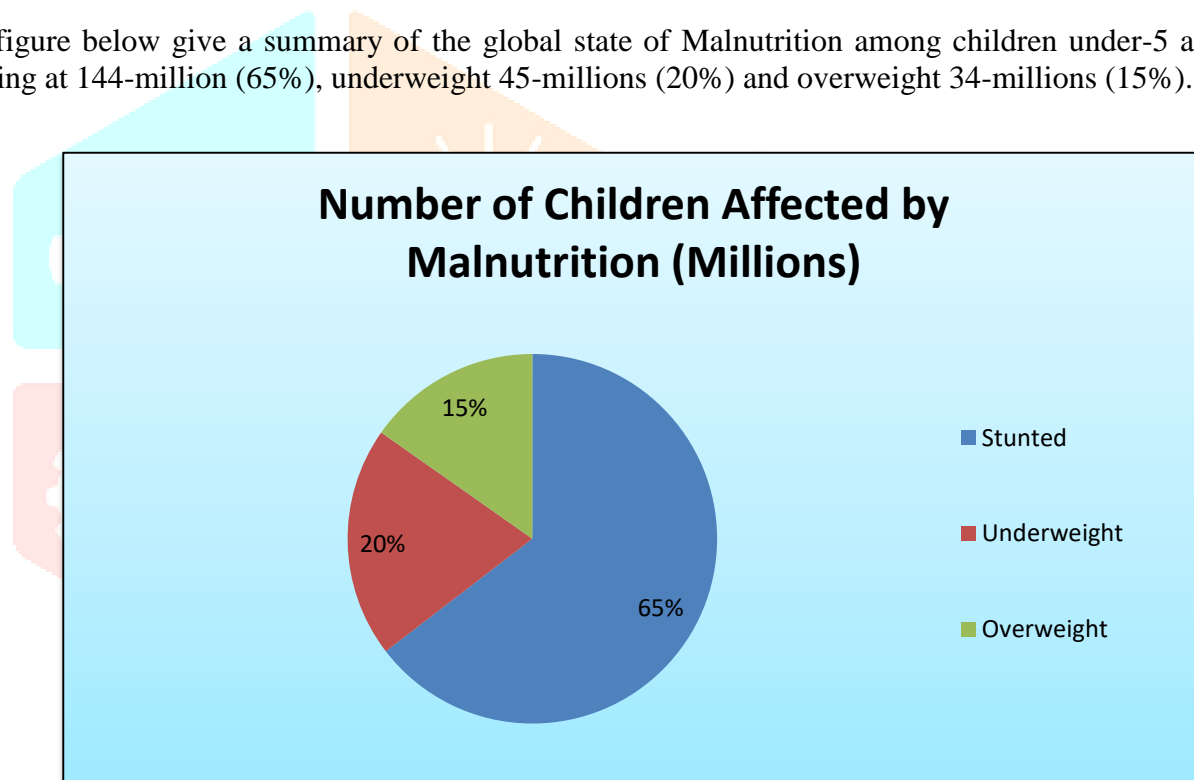


Fig 1.0: Current state of Malnutrition under-5 globally [WHO, 2019]

Current State of Malnutrition Nationally (India)

India: India is one of the fastest-growing countries in the region, both economically, academically, and technologically. There are various forms of malnutrition in India, such as under-nutrition, micronutrient deficiency, and over-nutrition. The symptoms of malnutrition include stunting (low height-to-age ratio), wasting (low weight-to-height ratio), and being overweight (low weight-to-age ratio). Overeating leads to a rise in body fat and diet-related illnesses that are not transmittable. In India, poverty, inadequate medical care, lack of hygiene, lack of nutritious food options, and inadequate nutrition education are some of the main causes of under-nutrition. The Global Hunger Index (GHI) 2021 placed India at 101 out of 116 nations, indicating a serious hunger situation. The fourth National Family Health Survey (NFHS-4), conducted in 2015-16, revealed a 38.4% prevalence of stunting (chronic malnutrition) in children under five years of age, wasting (acute malnutrition) at 21%, and underweight at 35.7%. Iron, vitamin A, iodine, and zinc are some of the micronutrients India faces difficulties with. Iron deficiency anemia and vitamin A

deficiency are two common ailments, especially among women and children. Iron and folic acid supplements are provided by programs like the National Iron Plus Initiative to combat iron deficiency anemia. Overeating is a growing issue in India, with a rising incidence of overweight and obese individuals, especially in urban areas. Changes in eating habits, sedentary lifestyles, and an increase in processed foods are some of the factors that contribute to the increase in malnutrition. The prevalence of obesity and diet-related non-communicable diseases has increased, especially in urban areas and among the wealthier population.

A summary of the current state of malnutrition in India is given below in the graph with stunting at 38.4%, wasting 21% and underweight 35.7%.

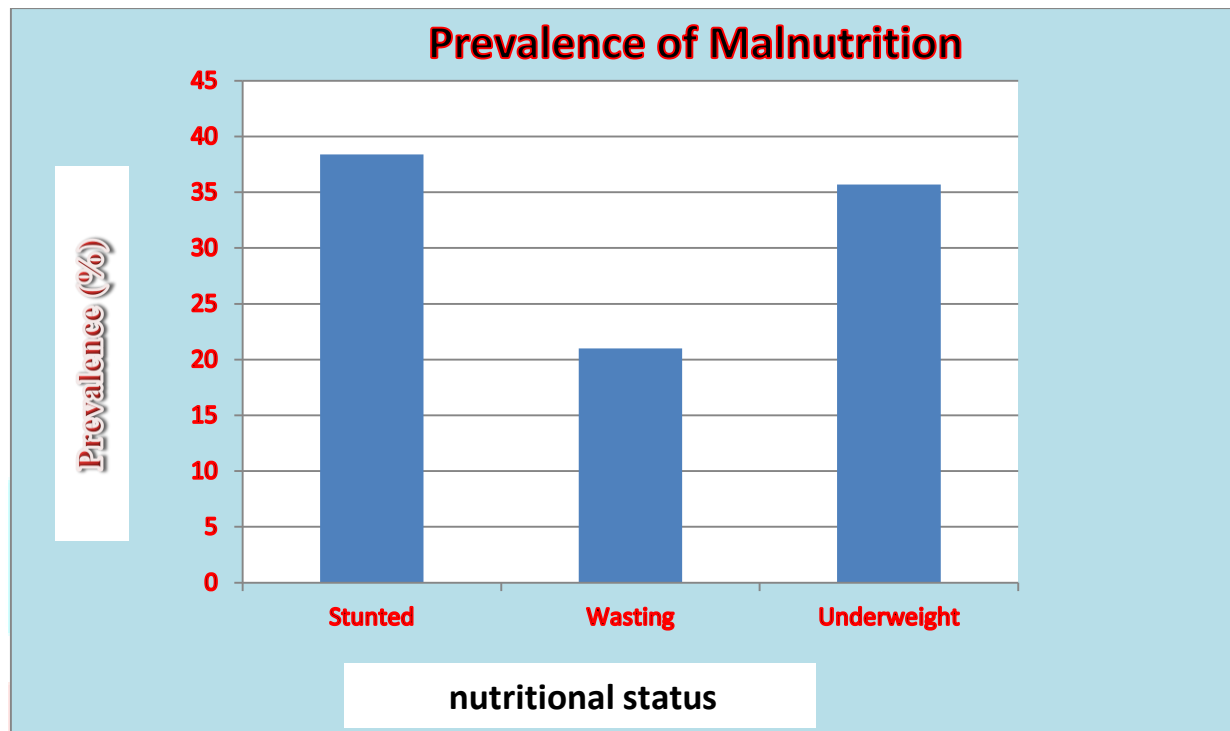


Fig 1.1: Prevalence of under-5 malnutrition in India [GHI, 2021 and NFHS-4, 2016]

Government Initiatives to Combat Malnutrition in India: The Indian government has enacted numerous programs and initiatives to combat malnutrition, including the Integrated Child Development Services (ICDS), the National Health Mission (NHM), Mid-Day Meal Scheme and the Public Distribution System (PDS), which aim to enhance the nutritional well-being of pregnant women, nursing mothers, and infants.

In India, efforts to combat malnutrition often involve enhancing the health of mothers and children, encouraging exclusive breastfeeding, enhancing access to nutritious food, providing nutritional supplements, and promoting healthy eating habits. Furthermore, proper hygiene practices and easy accessibility to potable water are vital in avoiding ailments related to inadequate nutrition. The National Health and Family Survey, the United Nations International Children's Emergency Fund, and the World Health Organization have documented alarming levels of malnutrition among adolescent girls, pregnant and lactating women, and children in India (Narayan, 2019). The country's malnutrition is caused by factors like the nutritional status of mothers, the way they nurse, the level of education of women, and hygiene issues (NFHS, UNICEF, and WHO, 2019). Despite the diminution of malnutrition in India over the past decade, and there are several government initiatives in place, there is still a need for the efficient application of the insights gleaned from research to combat hunger, especially since it hinders the socio-economic progress of the nation. India has failed to combat malnutrition, which adversely affects the country's socio-economic progress. One-third of the world's undernourished children reside in India and half the world's undernourished children reside in three nations: Bangladesh, India, and Pakistan (Hossain et al., 2020). The Global Hunger Index 2017 ranks India 100 out of 119 nations with a serious hunger crisis (GHI, 2017). The proportion of undernourished children in India surpasses that in sub-Saharan Africa, impacting mortality,

efficiency, and economic expansion. Half of Indian children suffer from malnutrition each year, and over a million children die before reaching the age of one month.

CAUSES OF MALNUTRITION (CONCEPTUAL FRAMEWORK OF CAUSATION)

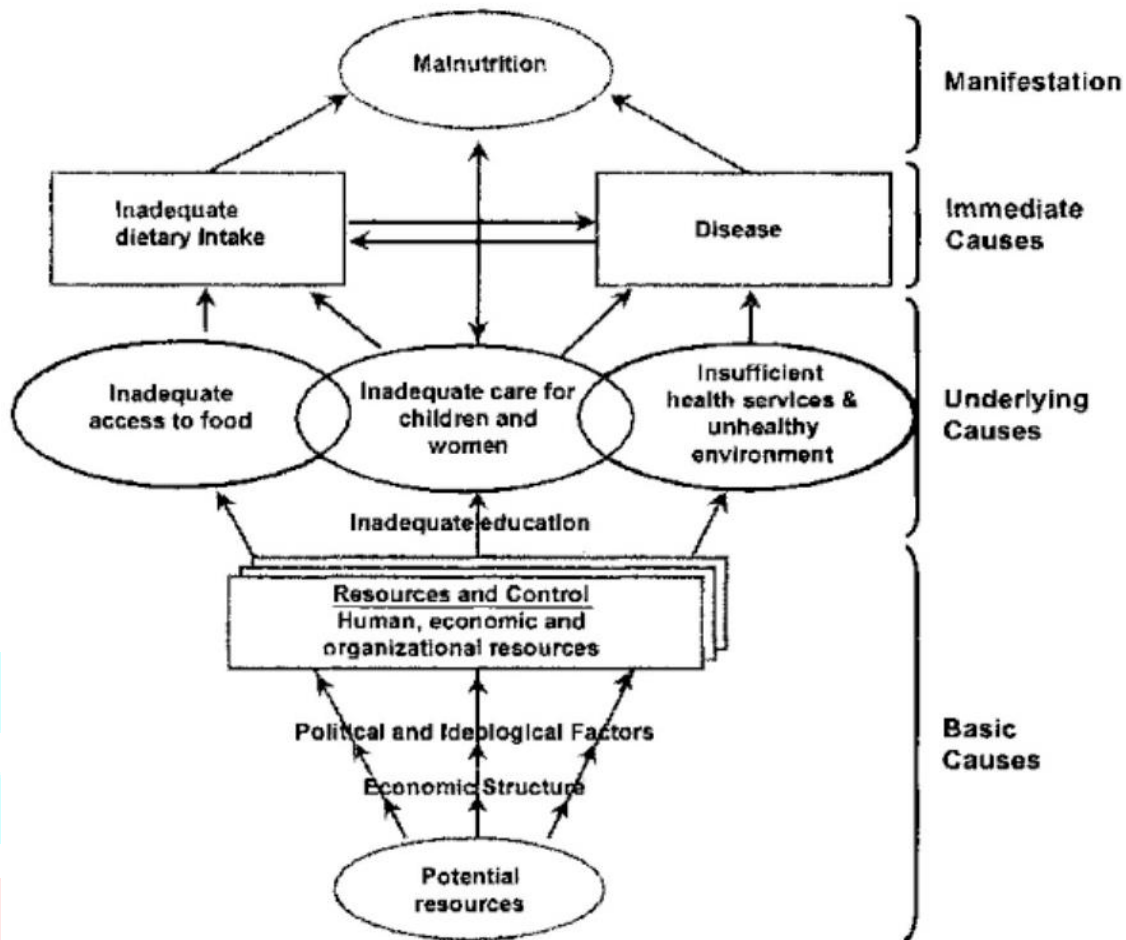


Figure 1.2: UNICEF Conceptual Framework of Malnutrition [UNICEF, 2020]

The conceptual framework developed by UNICEF explains the immediate, underlying and basic causes of malnutrition. This provides an important basis and an inter-sectoral approach to tackle nutritional problems (UNICEF, 2020).

Immediate causes: Inadequate nourishment and ailments are immediate causes of malnutrition. It's revealed that these two elements are connected. A low intake of food for a long time implies an inadequate supply of nutrients, which can lead to nutritional deficiencies, eventually leading to disease or illness. Diseases, on the other hand, put a lot of weight on the body. This demand may be the result of the body's attempt to fight off the disease and compensate for the losses caused by this stress. Many diseases can cause a loss of appetite, which can lead to inadequate intake of nutrients. Furthermore, diseases can often cause wasting, diarrhea, and acute respiratory diseases, which are responsible for most nutrition-related health problems in developing countries. It's important to remember that the immediate cause of malnutrition is rooted in the individual.

The Underlying causes of malnutrition affect the household and include inadequate food availability, carelessness, inadequate and inadequate health care, and an unhealthy environment. Poor income or limited food production will make it difficult for households to properly consume food. Poor health care and a contaminated environment (dirty water, contaminated food, and poor sanitation) can accelerate the spread of germs and illnesses. Nevertheless, the availability of nutritious foods, suitable health structures, and a healthy environment without supplying the necessary resources to those who require them and effectively employing them (lack of care) will adversely affect dietary wellness. In this context, care also includes a period of time, attention, and assistance to meet the diverse requirements of each household member.

The Basic causes: Malnutrition affects individuals and nations. What a country or community has to offer describes its potential assets. Poor resources can lead to limited financial and human resources, which in turn will affect social amenities, food production activities, and medical care, resulting in a deficient nutritional state. Poor policies and political views can also exacerbate nutritional issues, no matter how wealthy a country or community may be.

The figure below is give a summary of the complex interplay of dietary, socioeconomic and environmental influences on the rising epidemic of malnutrition in young children

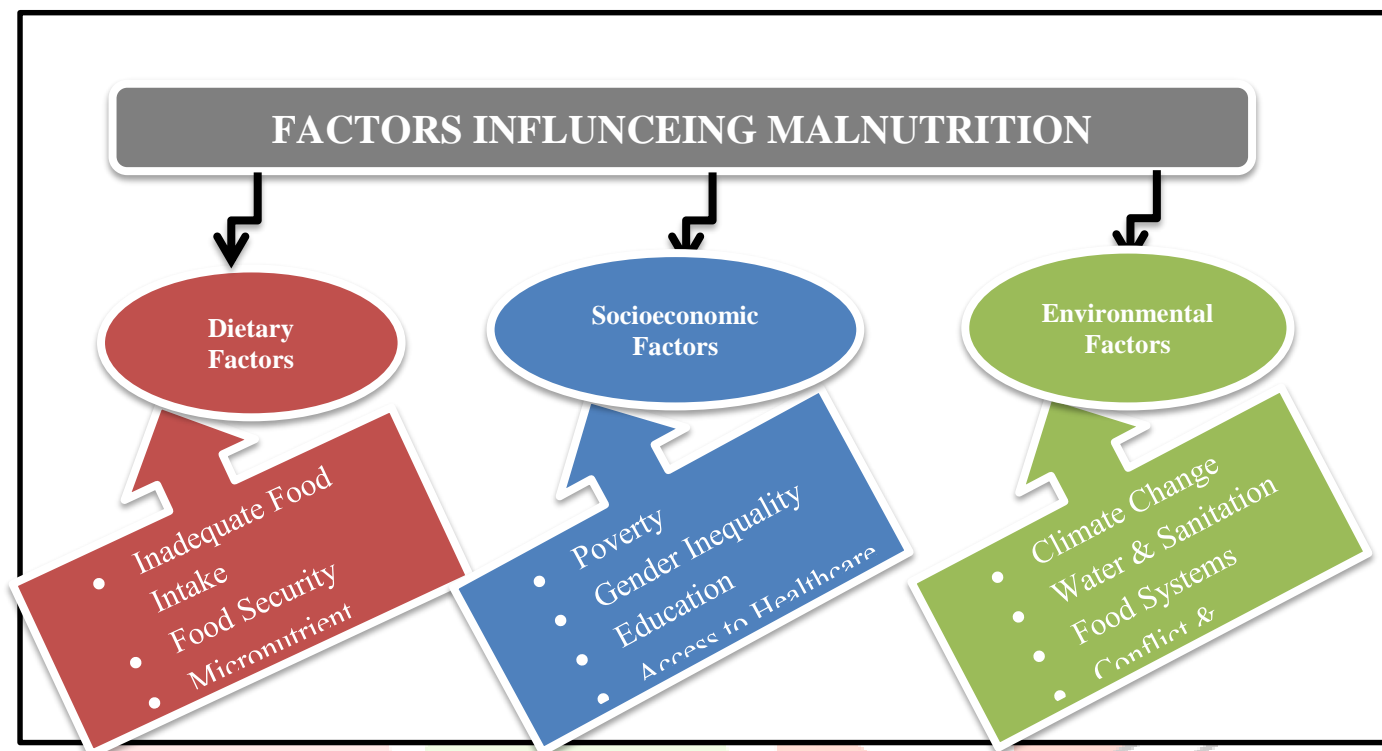


Fig 1.3: Multifaceted factors Influencing

DIETARY IMPACTS/EFFECTS ON MALNUTRITION

Dietary habits of children are a significant contributor to under-nutrition. Proper nutrition in the first 1000 days of life (from conception to two years old) is crucial for optimum growth, development, and well-being. Dietary intake is the amount and type of food consumed by an individual. Obesity, insulin resistance, and other non-communicable diseases have been linked to a diet rich in processed foods. A diet high in whole grains, fruits, and vegetables, on the other hand, has been linked to enhanced cognitive abilities and a decreased risk of enduring chronic illnesses (Dewey et al., 2017). Inadequate nutrition levels are a major factor in the development of stunted growth in infants. The World Health Organization estimates that over three billion people worldwide consume less than 500 grams of fruits and vegetables per day, which is below the recommended range of 400-500 grams for adults. The low intake of fruits and vegetables is especially prevalent among young children in low and middle-income countries, where diets often consist of starchy staples such as rice or cassava with limited variety in fruits, vegetables, and animal-derived foods (FAO et al., 2016). The insufficient intake of fruits, vegetables, and other healthy foods is a result of numerous factors, such as poverty, food scarcity, cultural preferences, and inaccessibility to a wide range of nutritious foods. Families may prioritize basic needs like shelter and clothing over food in many low-income countries (FAO et al., 2016). The issue of food insecurity is also significant, as individuals may be unable to procure sufficient supplies of food due to droughts, conflicts, or financial difficulties (FAO et al., 2016). Low intake of fruits, vegetables, and ASFs may be influenced by cultural preferences for certain foods, as some cultures favor starchy staples over more nutritious ones (FAO et al., 2016). The impact of food security on malnutrition is a new dynamic. Food intake is vital for growth and development, but insecurity can cause erratic dietary habits, diminished dietary intake, and a greater chance of under-nutrition. A study conducted in Ethiopia found that children in households with inadequate nutrition were more likely to suffer from stunting than those in households with adequate nutrition (Mohammed et al., 2018).

A holistic approach is required to tackle this escalating public health crisis. All three dynamics discussed above should be addressed by this strategy: micronutrient deficiency, dietary sufficiency, and food safety. Improvements in micronutrient intake through fortification programs or supplementation have yielded promising outcomes (Dewey et al., 2017). The same thing has happened to initiatives aimed at encouraging healthy eating habits through educational initiatives and policy changes (Hawkes et al., 2017). Moreover, efforts aimed at enhancing food safety via agricultural improvement initiatives and social security policies have also yielded favorable results (Mohammed et al., 2018). The absence of diverse food options due to geographical isolation or market failures may limit the nutritional options available to families (FAO et al., 2016). Nutrient absorption refers to the process by which nutrients are absorbed from food into the body for use in diverse physiological processes. Malabsorption syndromes can be caused by a variety of conditions, such as gastrointestinal disorders or genetic disorders that hinder nutrient uptake (World Health Organization, 2019). Deficiencies in certain nutrients, such as iron or vitamin B12, that are crucial for optimal growth and development, can be caused by malabsorption (World Health Organization, 2019). Furthermore, certain foods may contain harmful substances, such as phytates or oxalates, which can bind with elements such as iron or calcium and diminish their bioavailability (World Health Organization, 2019). Food preparation techniques and cultural customs can impact nutrient absorption. Traditional methods, such as boiling or fermenting, may increase the bioavailability of certain nutrients, such as iron or zinc, by reducing anti-nutrient content or increasing mineral solubility (FAO et al., 2016). The use of modern processing techniques, such as canning or grilling, may result in a decrease in nutrient availability due to the use of heat or the addition of salt or fat (FAO et al., 2016). As a result, cultural practices can have both positive and negative effects on nutrient absorption. The dietary habits of many low- and middle-income nations are characterized by a high intake of starchy staples and a low intake of protein-rich foods, resulting in protein-energy deficiency. Several studies have highlighted the importance of complementary feeding practices in preventing PEM. The study found that timely introduction of complementary foods and adequate feeding frequency were associated with lower prevalence of stunting and underweight among young children. In low- and middle-income countries, micronutrient deficiencies are widespread among young children.

Micronutrient deficiencies in Malnutrition: The most common micronutrient deficiencies affecting young children worldwide are iron deficiency anemia. The World Health Organization estimates that in 2019, 24% of children under five years old will suffer from IDA (WHO, 2021). The WHO estimates that 31% of children under five years old in low-income countries have a zinc deficiency, making it a common micronutrient deficiency affecting young children. An estimated 38% of children under five years old experience vitamin A deficiency in LMICs (WHO, 2021). Recent research has highlighted the significance of micronutrient deficiencies in under-nutrition. Calories are vital for bodily growth and development, but micronutrients like iron, zinc, and vitamin A are equally crucial for specific bodily functions. The absence of these essential nutrients has been linked to stunted development, cognitive decline, and heightened vulnerability to pathogens. Children with low iron status were more likely to be stunted and have lower cognitive scores than those with adequate iron intake, according to a study conducted in Bangladesh. Low intake of micronutrient-rich foods and high intake of energy-rich but nutritionally deficient foods are major contributors to malnutrition (Bhutta et al., 2013). Insufficient intake of essential micronutrients like iron, vitamin A, and zinc can result in diminished growth and development (Bhutta et al., 2013). A high intake of energy-rich but nutrient-poor foods, such as processed snacks and sugary drinks, can contribute to overweight and obesity, which further increases the risk of under-nutrition due to a decreased intake or absorption of essential nutrients (Bhutta et al., 2013). Nutritional status during early childhood is impacted by breastfeeding, a critical dietary factor. The process of nursing supplies vital nutrients necessary for growth and development, as well as protection against infectious diseases (Bhutta et al., 2013). Suboptimal breastfeeding techniques, such as the early introduction of complementary foods or the insufficient duration of breastfeeding, can have a negative impact on one's nutritional status (Bhutta et al., 2013). Poor complementary feeding habits, such as a low intake of micronutrient-rich foods or an excessive use of homemade complementary foods, can further contribute to malnutrition. The development of young children depends on specific nutrients, such as protein, iron, vitamin A, zinc, iodine, and folate (JMP, 2019). Inadequate intake of these nutrients can result in stunted growth and cognitive decline in infants (JMP, 2019). Dietary deficiencies in micronutrients are a contributing factor in under-nutrition in young children. Insufficient intake or absorption of vital vitamins and minerals essential for wholesome growth is referred to as micronutrient deficiencies. Micronutrient deficiencies can lead to adverse health outcomes such as stunted growth and cognitive impairment in young children [JMP, 2019]. Inadequate intake of vital minerals like iron, zinc, vitamin A, and iodine can result in stunted growth, cognitive decline, and other health issues

(Bhutta et al., 2013) A study by (Mwansambo et al. 2018) revealed a higher risk of stunting in children in rural Zambia if they don't eat meat. The study also revealed that maternal education served as a shield against stunting, as higher maternal education levels were associated with a higher consumption of animal-based foods among children. Preventing under-nutrition hinges on the quantity and variety of a child's food intake. Lacking essential micronutrients like iron, zinc, vitamin A, and iodine can cause stunted growth, cognitive decline, and increased vulnerability to infections (Dewey & Brownrigg, 2014). Furthermore, excessive intake of energy-rich but nutritionally deficient foods, such as sugar-sweetened beverages and processed snacks, can contribute to excess weight gain and obesity, which are associated with nutritional deficiencies (Cook et al., 2019). The act of nursing is an essential part of a nutritious diet for infants. The first six months of life are filled with all the essential nutrients for a baby's growth and development (Dewey & Brownrigg, 2014). Furthermore, research has shown that maternity care decreases the risk of contagious diseases, such as gastrointestinal distress and respiratory infections (Black et al., 2013). The benefits of breastfeeding and malnutrition can be undermined by cultural practices like early weaning and formula feeding (Dewey and Brownrigg, 2014).

Effects of Micronutrient Deficiencies on Child Growth and Development: The absence of essential micronutrients has a significant impact on the development of children. Iron plays a crucial role in brain development, making it essential for normal cognitive development. Children with low iron levels are more likely to exhibit cognitive decline and low academic achievement (Bhutta et al., 2013). A healthy immune system and growth depend on zinc (Bhutta et al., 2013). Children with zinc deficiency are at increased risk of infectious diseases and stunted growth. Regular eyesight and immune function depend on the presence of vitamin A (Bhutta et al., 2013). Children lacking vitamin A are more likely to experience blindness and die from infectious diseases (Bhutta et al., 2013).

CONSEQUENCES OF POOR NUTRITION DURING CHILDHOOD

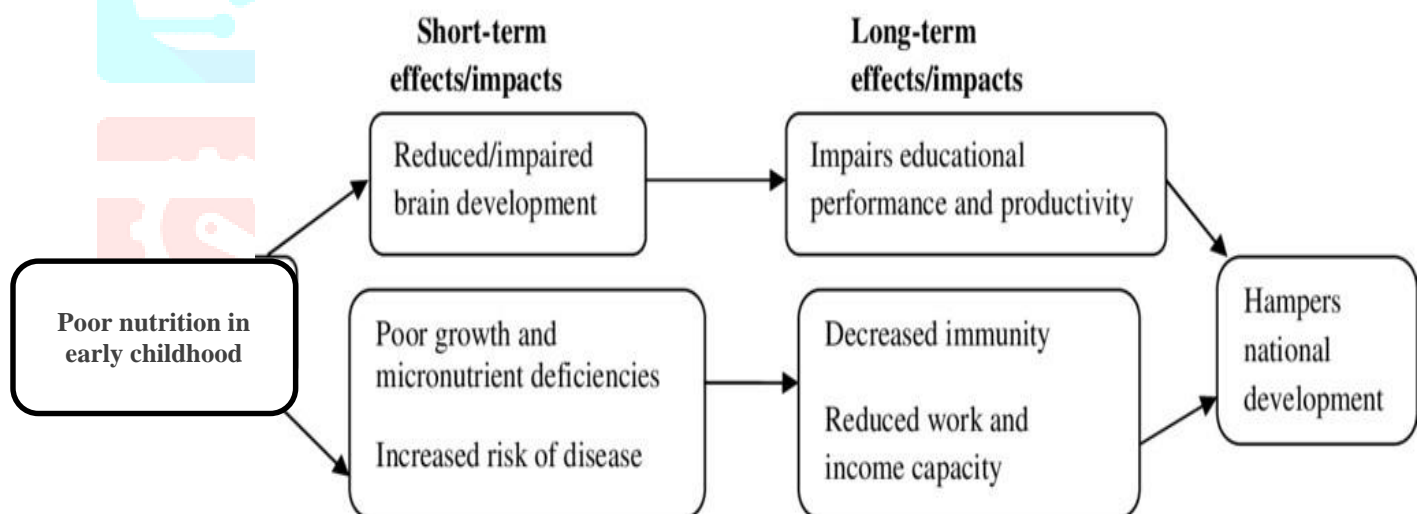


Fig 1.4: Short and long-term effects of poor nutrition during childhood

Short-term and Long-term impact of poor nutrition on child malnutrition

The impact of poor nutrition on children's health and development can be both short- and long-term. *In the short term*, inadequate nutrition can lead to symptoms such as fatigue and irritability. Children who are malnourished may experience stunted growth, delayed cognitive development, and increased susceptibility to infections and diseases (Bhutta, et al., 2017). Poor nutrition in childhood can have *long-lasting*, serious consequences. Chronic hunger can lead to stunted growth, which can affect a child's physical and cognitive development, resulting in diminished educational and financial prospects as adults (Saxena and N.C, 2018). In adulthood, malnourished children are more likely to develop chronic illnesses like diabetes, obesity, and cardiovascular disease (Mwene-Batu et al., 2021).

Furthermore, inadequate nourishment in infancy can have a lasting impact on subsequent generations. Malnourished mothers are more likely to give birth to babies with low birth weight, who are more likely to develop chronic illnesses and have poor health throughout their lives. Poor nutrition and poor health can perpetuate poverty and social inequity, creating a vicious cycle of poor nutrition and poor health outcomes across generations.

THE IMPACT OF SOCIOECONOMIC INFLUENCE ON MALNUTRITION

Inadequacy in nutrition, hygiene, and healthcare are some of the factors that contribute to malnutrition. Malnutrition can have serious and lasting effects on a child's health and development, leading to stunted growth, cognitive decline, and heightened vulnerability to ailments. Research has shown that poverty and low household incomes are major contributors to under-nutrition in infants and young children. The study by (Dewey et al. 2018) revealed that children from low-income households are more likely to be stunted, underweight, and suffer from wasting. The risk of malnutrition is exacerbated by the lack of access to diverse and nutritious foods, which is prevalent in low-income households (Mohammed et al., 2019).

Poverty is a significant factor in stunting in infants. Lack of nutrition for children in poverty increases their susceptibility to malnutrition. A report by UNICEF (2019) shows that children living in extreme poverty are four times more likely to stunt than those living in households with more money. Lack of resources during pregnancy can lead to low birth weight and an increased risk of malnutrition during childhood (Black et al., 2013). Financial constraints that prevent families from purchasing enough food for their children's needs can contribute to food insecurity. A study by Dewey et al. (2018) revealed that children from low-income households had lower weight-to-length ratios than their wealthier counterparts. The study also revealed that maternal education served as a shield against malnutrition, with higher maternal education levels being associated with lower rates of malnutrition among infants. Lack of resources plays an important role in stunting growth in infants. Poor sanitation, limited healthcare resources, and inadequate access to nutritious foods make children from low-income households more likely to be undernourished (Black et al., 2013). Furthermore, economic hardship frequently results in food scarcity, resulting in households' inability to procure sufficient nourishment to satisfy their most basic requirements. This can lead to omitting meals, reducing serving sizes, or consuming fewer nutritious options, all of which contribute to the risk of under-nutrition (Cook et al., 2019). **Inequality:** The growing epidemic of under-nutrition among young children is fueled by inequality. Income inequality, educational inequality, and healthcare inequality are some of the manifestations of inequality. The disparity in gender in the world of work contributes to the nutritional deficiency of infants. During times of low food supplies, girls often get the better of it when it comes to eating. Gender-biased nutrition, also known as gender-specific diets, can result in stunted growth and long-term health issues for women (Haddad et al., 2016). A lack of educational and employment opportunities for women can exacerbate poverty and food insecurity, leading to higher rates of malnutrition among their children (Black et al., 2013). Unequal access to resources makes children from disadvantaged backgrounds more likely to suffer from malnutrition (Victora et al., 2019). High-cost or lack of availability in their communities may prevent children from low-income households from obtaining nutritious meals (Black et al., 2013). Additionally, children from disadvantaged backgrounds may not have access to quality education or healthcare services due to financial constraints or geographic barriers (Victora et al., 2019).

Education is crucial in preventing stunting in infants. Knowing more about food can help parents make better choices about their kids' diets and promote healthy eating habits (Black et al., 2013). Learning about maternal nutrition during pregnancy and lactation can empower women (Victora et al., 2019). However, a lack of formal education can also contribute to nutritional deficiencies in infants. Children from economically disadvantaged backgrounds may face difficulties in receiving high-quality instruction or may abandon school due to financial constraints or other obstacles (Victora et al., 2019). Lacking education can result in inadequate nutrition understanding and practices among parents and other family members.

Access to Healthcare: The availability of medical care is an essential element in preventing malnutrition in infants and toddlers. High-quality medical care is more likely to prompt the identification and treatment of malnutrition in children (Black et al., 2013). Furthermore, health care providers can impart information regarding food intake and hygiene habits (Victora et al., 2019). Nevertheless, the availability of medical care varies considerably among local populations. Financial limitations or geographical obstacles may prevent children from disadvantaged backgrounds from availing superior medical care (Victora et al., 2019). Lack of availability can delay the identification and treatment of malnutrition, aggravated by its detrimental effects on infant and adolescent wellbeing.

Cultural beliefs and practices: The escalating epidemic of malnutrition among young children is influenced by *cultural beliefs and practices*. Some traditions may encourage unhealthy eating habits or prevent people from consuming nutritious foods (Black et al., 2013). Some cultures, for example, may place a higher value on feeding boys than girls or on feeding older siblings over younger ones (Victora et al., 2019). Inadequate nutrition can be caused by these cultural practices. Furthermore, certain cultural assumptions may restrict access to medical care or prevent parents from seeking medical assistance for their children's health concerns (Victora et al., 2019). Delays in identifying and treating malnutrition can compound its detrimental effects on child health and development. Some cultures don't prioritize or promote breastfeeding, which can result in inadequate or premature weaning (Dewey et al., 2018). The child's intake of nutrients can decrease, putting them at greater risk of starvation. Cultural customs related to food preparation and consumption can affect the nutritional content of meals. The traditional method of preparing grains may result in diminished absorption of nutrients (Dewey et al., 2018).

ENVIRONMENTAL FACTORS INFLUENCING MALNUTRITION IN CHILDREN

Environmental factors like global warming, calamities, and armed conflicts influence malnutrition among young children. Catastrophes and conflicts can exacerbate hunger and malnutrition (Dewey et al., 2018). Extreme weather conditions, such as heat waves and droughts, disrupt food production, distribution, and accessibility, leading to an increased risk of undernutrition (Kumar et al., 2019). The malnutrition crisis is exacerbated by conflicts and displacement, which leads to disruptions in medical care and food distribution networks (Cornelius et al., 2019). Furthermore, environmental degradation can result in a decrease in the availability of essential resources, such as water and cultivable land, which can further exacerbate malnutrition (Dewey et al., 2018). The effects of global warming are also contributing to nutritional deficiencies, as they increase the frequency and severity of natural disasters, leading to lower crop yields (Dewey et al., 2018).

Other aspects of the environment, such as cleanliness, hygiene, and exposure to environmental contaminants, can also contribute to nutritional deficiencies in infants. Poor sanitation increases the likelihood of gastrointestinal illnesses, which can result in inadequate absorption of nutrients and dehydration (Black et al., 2013). Hoddinott et al. (2017) examined the association between improved sanitation and lower rates of stunting among children in rural Bangladesh. The study also revealed that exposure to environmental contaminants, such as polluted air, was associated with a higher likelihood of stunting in children. Food shortages and price spikes can be caused by droughts, floods, and other extreme weather phenomena that disrupt food production and distribution systems. Furthermore, environmental contaminants, such as polluted air and polluted water, can have a negative impact on children's health by increasing the risk of respiratory ailments and gastrointestinal disorders (Cook et al., 2019). **Climate change** The impact of *climate change* on child nutrition is significant. The escalating temperatures, dry spells, and erratic rainfall patterns are causing crop failures, diminished agricultural output, and food insecurity. Lacking access to diverse and nutritious foods can result in under-nutrition among infants. According to a study by the World Health Organization, climate change could lead to an additional 529,000 child deaths due to malnutrition by the year 2050.

Water, hygiene and sanitation are crucial environmental influences that contribute to malnutrition in infants and toddlers. Lack of access to clean water and poor water quality can lead to diarrheal illnesses, which can lead to malnutrition due to nutrient loss through vomiting. Furthermore, inadequacies in hygiene standards contribute to the transmission of water-borne illnesses, aggravated by inadequate nutrition.

Food System: A study by the United Nations Children's Fund found that enhancing water, sanitation, and hygiene practices could help prevent up to 30% of child deaths due to malnutrition (UNICEF, 2019). Malnutrition among young children is influenced by *food systems*. The current food systems rely on processed and ultra-processed foods, which are often high in calories but low in nutrients. Overeating calories and under-consuming essential micronutrients result in under-nutrition among young children. Furthermore, food systems are often characterized by disparities in the availability of nutritious and healthy foods, with low-income households being particularly vulnerable to nutritional deficiencies. According to a study by the Food and Agriculture Organization, improving food systems could prevent up to 45% of child deaths due to malnutrition. **Conflict and displacement** are major environmental influences that contribute to stunting in young children. Moving places disrupts food networks and prevents people from having access to diverse and nutritious foods, leading to nutritional deficiencies in children. Furthermore, disagreements frequently result in the interruption of vital amenities, such as medical care and sanitation facilities, further aggravating the issue of malnutrition. A study by the UNICEF revealed that children in conflict zones are more likely to suffer from malnutrition than those in non-conflict zones (UNICEF, 2019).

Lack of resources restricts the availability of sufficient nourishment, pure water, and medical care, which are crucial for preventing and treating malnutrition. Lacking resources also restricts educational opportunities, which can result in unhealthful health-seeking behaviors and unhealthy eating habits (Hoddinott et al., 2019) Malnutrition among young children is exacerbated by *inadequate food security*. A lack of adequate and nutritious food is referred to as 'food insecurity' (Bhutta et al., 2013) Food-insecure households have higher rates of malnutrition than those with adequate nutrition (Dewey et al., 2017) Various factors can contribute to food insecurity, such as poverty, armed conflict, calamities, and global warming (Bhutta et al., 2013).

RECOMMENDATIONS FOR POLICY AND INTERVENTION STRATEGIES

An approach that addresses socioeconomic, dietary, and environmental factors simultaneously is required to address the multidimensional issue of malnutrition among young children. Some recommendations for policy and intervention strategies include the following:

Addressing poverty through programs like cash transfers and conditional cash transfers can ensure that families have the resources they need to provide their children with adequate amounts of food and other basic necessities, such as healthcare and education (Hoddinott et al., 2019) Promoting income-generating ventures like microfinance initiatives can aid families escape poverty and enhance their children's nutritional well-being.

Improving breastfeeding practices: Breastfeeding gives babies all the vital nutrients they require in the early years. Governments should encourage exclusive breastfeeding during the first six months of life, as it provides all the essential nutrients for rapid growth and development [World Health Organization, 2016]. Furthermore, promoting continued breastfeeding beyond six months of age can help ensure that infants continue to receive important nutrients as they transition to solid foods. The introduction of complementary feeding should be gradual after six months, while continuing to breastfeed until the age of two or beyond (World Health Organization, 2016) Giving information about the benefits of breastfeeding and supporting women on their breastfeeding journeys could be part of this (Dewey et al., 2018).

Improving access to clean water and sanitation is crucial for avoiding diarrheal illnesses, which can result in nutritional deficiency due to nutrient loss through vomiting. Providing access to potable water and sanitation facilities can ward off diarrheal ailments and reduce the likelihood of undernutrition. Promoting good hygiene habits and reducing the risk of diarrheal diseases are some of the things governments should invest in. Such steps should be accompanied by educational initiatives promoting safe hygiene habits among mothers and other family members. The goal of water sanitation hygiene programs is to improve access to clean water, encourage good sanitation habits, and encourage good hygiene habits (Hoddinott et al., 2019).

Improving maternal nutrition during pregnancy is crucial for the growth and development of the fetus. Providing pregnant women with a variety of nutritious meals can ensure that their children acquire sufficient quantities of vital micronutrients during the period of fetal development. Moreover, supplying pregnant women with iron supplements can aid in preventing anemia and enhancing their nutritional status.

Improving access to diverse and nutritious foods is possible through nutrition enhancement initiatives, which involve adding vital micronutrients to common food groups like rice, wheat flour, and salt. This can help ensure that individuals are getting enough of these essential micronutrients. Promoting a variety of nutritious foods through ag extension programs and home gardening initiatives can also ensure that individuals consume a variety of nutritious foods.

Reducing environmental contamination: Governments should implement policies to minimize environmental contamination, such as controlling industrial emissions and promoting sustainable energy (Hoddinott et al., 2017) Education programs on the health hazards associated with environmental contamination should accompany such actions. Implementing programs that address environmental degradation and promote eco-friendly farming methods is one way to accomplish this. Working with communities to understand cultural beliefs about nutrition and developing culturally appropriate interventions that take these beliefs into account is one way to address this.

Providing education about nutrition and feeding practices for mothers with lower educational attainments could be a part of this improvement. The purpose of dietary education programs is to encourage healthy eating habits among mothers and other family members (Hoddinott et al., 2019) The effectiveness of dietary education programs has been demonstrated by promoting nutritious eating habits (Hoddinott et al., 2019). During times of crisis, such as natural catastrophes or economic shocks, *social protection programs* provide a safety net for vulnerable populations. The effectiveness of protection programs in reducing poverty levels has been demonstrated (Hoddinott et al., 2019).

CONCLUSION AND FUTURE ASPECTS

The escalating epidemic of malnutrition among young children is influenced by a complex combination of societal, nutritional, and environmental variables. Lack of resources, inequalities between genders, low-quality and varied food choices, cultural norms related to lactation, climate change, calamities and environmental degradation are some of the contributing factors. A multidimensional approach is required to address this multifaceted issue. This paper examines the existing literature on this topic and reveals the undiscovered causes of this scourge. Policy and intervention strategies that can address this multifaceted issue are suggested in the paper. Policies aimed at reducing poverty and promoting gender equality may be included, as well as programs aimed at improving dietary quality and variety, increasing access to diverse and nutritious foods, clean water and sanitation facilities, maternal nutrition during pregnancy, breastfeeding practices, and addressing poverty through social protection programs. Implementing these interventions will require political commitment, financial support, and cooperation between governments, international organizations, non-governmental organizations, and other parties involved in society at all levels. The impacts of climate change and environmental pollution are mitigated by interventions that promote breastfeeding and address cultural barriers. Uncovering these enigmatic forces and delving into their intricate connections can help us craft more effective methods for preventing stunted growth in infants.

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