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Effect of malnutrition on children's growth, development and health in India

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Abstract

"Malnutrition is a silent emergency". Malnutrition shows a decline in health due to the disproportion of nutrients and energy in the body. India has achieved remarkable levels of economic growth, and yet, despite all the progress, it continues to host the highest number of malnourished children in the world.

Malnutrition is widely prevalent among Indian children as well as in other developing countries. Malnutrition affects physical as well as mental growth.

Child is the important part of the population. In India 19% (190 million) of the growing child which is suffering from deficiency, or excess of energy-protein and micro nutrients causes effects on tissue/ body shape, size, composition, function.

According to WHO, nutritional is the intake of food considered in relation to the body's dietary need. Good nutrition is an adequate, well balanced diet with regular physical activity. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development and reduced productivity.

Nutrition plays a vital role in the growth and development of children. This period is nutritionally significant because this is the prime time to build up body stores of nutrients in preparation for rapid growth of children. An inadequate nutrition during childhood may lead to malnutrition, growth retardation reduced work capacity and poor mental and social development.

Malnutrition refers to deficiencies, excess or imbalances intake of energy, protein and/ or other nutrients. The term malnutrition correctly includes both under nutrition and over nutrition. Many factors affecting the nutritional status of children, including child related factors such as age, sex, birth order, birth weight, dietary, pattern. The nutrition status of children is worst. To decrease the incidence of malnutrition in children, the present research study has been structured to analyze the health, nutritional status, growth and development of children and to find out the role of nutrition.

Keywords: Malnutrition, nutrition, health, nutritional status, children, growth, deficiency disease.

Introduction

Malnutrition is a major health problem. Malnutrition remains a pressing issue affecting millions of children in India and leads to severe physical and cognitive developmental challenges.

"Malnutrition is a silent emergency". Malnutrition shows a decline in health due to the disproportion of nutrients and energy in the body. Malnutrition is one of the main risk factors related to children's morbidity and mortality. It is estimated that about 52.50% of child mortality is linked to malnutrition and its associated diseases. Malnutrition is defined as pathological state resulting from a relative or absolute deficiency or excess of one or more essential nutrients. It comprises of under nutrition, over nutrition, imbalance and specific deficiency.

Malnutrition is not only an important cause of childhood mortality and morbidity, but also leads to permanent impairment of both physical and mental growth of those who survive. Inadequate intake of food, both in quality and quantity, infection, poor environmental condition, poor mental health, inadequate health services and large family size, are the major contributory factors. Not only that, in the current scenario the trends of rise in overweight is increasing, which is leading double burden of malnutrition.

Malnutrition is major problem in developing countries. India is the seventh largest country geographically, second most populated and 12th largest economy in the world.

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India loses 4% of its GDP annually due to malnourishment and hence, the objective of economic development cannot be met without addressing the issue of child malnutrition. India has achieved remarkable levels of economic growth, and yet, despite all the progress, it continues to host the highest number of malnourished children in the world. Hence, it is an indicator of chronic childhood malnutrition, which can lead to irreversible mental and physical damage that is even transmitted to the next generation.

As CARE Reported in 2008 more than 153 million of the world malnourished people are children age groups of 5 and six million children under the age of 5 die every year due to hunger. Children who suffer from malnutrition is not only problem of present day but also an issue for the future. Malnutrition is a deficiency of poor diet, improper intake of energy and nutrient. Nutrition plays an important role in a child's growth and development.

Under nourished mother are also more likely to give birth to babies who are underweight. Malnutrition is the most severe consequence of food insecurity.

WHO says 45% of deaths among children under the age of five in low and middle income countries can be directly linked to under nutrition, lack of essential vitamins minerals and nutrients. Insufficient vitamin A is the leading cause of preventable childhood blindness.

During infancy and early childhood needs high nutritional requirement for growth and development, poor prenatal condition is responsible for 23% of all deaths among them. For e.g. diarrhea, acute infection, measles, malaria, HIV with protein energy malnutrition, tetanus, diphtheria, hepatitis B and C.

Malnutrition refers to a deficiency of certain macro and micronutrients. It can lead to stunted growth, eye problems, diabetes, heart disease, mental retardation. It delays physical growth and motor development, lower intellectual quotient (IQ), greater behavioral problems, and deficient social skills, susceptibility to contracting diseases. It causes permanent, widespread damage to a child's growth, development, and well-being.

Malnutrition is broadly divided into four types- stunting, wasting overweight, and underweight

The indicators stunting, wasting, overweight and underweight are used to measure nutritional imbalance such imbalance results in either under nutrition (assessed from stunting, wasting and underweight) or overweight. Child growth is internationally recognized as an important indicator of nutritional status and health in populations.

Stunting, wasting and overweight in children aged under 5 years are included as primary outcome indicators in the core set of indicators for the Global Nutrition Monitoring Framework to monitor progress towards reaching Global Nutrition Targets 1, 4 and 6. These four indicators are also included in WHO Global reference list of 100 core health indicators.

Stunting: Children who suffer from growth retardation as a result of poor diets or recurrent infections tend to be at greater risk for illness and death. Stunting is the result of long-term nutritional deprivation, and often results in delayed mental development, poor school performance and reduced intellectual capacity. In turn, this affects economic productivity at the national level. Women of short stature are at greater risk for obstetric complications because of a smaller pelvis. Also, small women are at greater risk of delivering an infant with low birth weight, contributing to the inter-

generational cycle of malnutrition, because infants of low birth weight or retarded intrauterine growth tend to be smaller as adults. Stunting - height-for-age < 2 SD of the WHO Child growth standards median.

Wasting: Wasting in children is a symptom of acute under nutrition, usually as a consequence of insufficient food intake or a high incidence of infectious diseases, especially diarrhea. In turn, wasting impairs the functioning of the immune system and can lead to increased severity and duration of, and susceptibility to, infectious diseases, and an increased risk of death. Wasting weight-for-height < 2 SD of the WHO Child growth standards median.

Overweight: Over nutrition is a form of malnutrition that occurs when a person's diet provides too many calories, leading to obesity and other health problems. Over nutrition is prevalent in developed countries, where access to high-calorie, low-nutrient foods is common.

Symptoms of over nutrition include weight gain, high blood pressure, and increased risk of chronic diseases such as diabetes and heart disease. Treatment options may include changes to the diet and increased physical activity. Childhood obesity is associated with a higher probability of obesity in adulthood, which can lead to a variety of disabilities and diseases, such as diabetes and cardiovascular diseases. s Overweight - weight-for-height +2 SD of the WHO Child growth standards median.

Underweight: Under nutrition is a form of malnutrition that occurs when a person's diet does not provide enough calories to meet their body's needs. Under nutrition is prevalent in developing countries, particularly among children.

Symptoms of under nutrition include weight loss, fatigue, weakness, and delayed growth in children. Treatment options may include nutritional supplements, changes to the diet, and nutritional support in severe cases. Underweight-weight-for-age < -2 standard deviations (SD) of the WHO Child growth standards median.

Classification of malnutrition on the basis of absent of nutrition in the diet

There are several types of malnutrition, each with its own unique causes, symptoms, and treatment options.

1. Protein-Energy Malnutrition (PEM)

Protein-Energy Malnutrition (PEM) is the most common form of malnutrition worldwide. It is caused by a lack of protein and calories in the diet and it can lead to stunted growth, weakened immune systems, and other health problems. PEM is most prevalent in developing countries, where access to nutritious food is limited. Kwashiorkor and marasmus is most common disease.

Symptoms of PEM include weight loss, fatigue, weakness, delayed growth in children, and poor wound healing. Treatment options may include nutritional supplements, changes to the diet, and nutritional support in severe cases.

2. Micronutrient deficiency

Micronutrient deficiency occurs when a person's diet lacks essential vitamins and minerals, such as iron, vitamin A, and iodine. This type of malnutrition can lead to a range of health problems, including anemia, blindness, and cognitive impairment. Micronutrient deficiency is prevalent in both developed and developing countries.

Symptoms of micronutrient deficiency vary depending on the specific nutrient deficiency but may include fatigue, weakness, impaired cognitive function, and vision problems. Treatment options may include nutritional supplements and changes to the diet.

Causes of Malnutrition

Malnutrition can be caused by a range of factors, including:-

1. **Lack of food:** This is the most common cause of malnutrition, particularly in developing countries where access to food is limited.
2. **Poor quality food:** Even if food is available, it may not provide adequate nutrients if it is of poor quality or lacking in variety.
3. **Digestive problem:** Certain digestive disorders, such as celiac disease or crohn's disease, can prevent the body from absorbing nutrients properly.
4. **Mental health conditions:** Depression, anxiety, and other mental health conditions can interfere with a person's ability to eat well and maintain a healthy diet.

Children have the reputation of having the worst eating habits they usually skip a meal particularly breakfast. Missing breakfast may be due to eating disorder lack of time and no nutritional awareness. Deficiency of nutrition cause malnutrition which is related to poor diet or several disease and infection and it is mostly cause of death.

Symptoms of Malnutrition: The symptoms of malnutrition can vary depending on the severity and duration of the condition. Common symptoms include.

1. **Weight Loss:** Malnutrition often leads to significant weight loss, particularly in children and older adults.
2. **Fatigue:** People with malnutrition may feel tired and weak due to a lack of energy from nutrients.
3. **Weakness:** Muscles may become weak due to a lack of protein in the diet.
4. **Delayed growth:** Children with malnutrition may experience stunted growth and developmental delays.
5. **Poor wound healing:** A lack of nutrients can interfere with the body's ability to heal wounds and fight infection.

Prevention of malnutrition

Preventing malnutrition requires a focus on improving access to nutritious foods and promoting healthy eating habits. Strategies for prevention include:-

1. **Education:** Providing education on nutrition and healthy eating habits can help to improve awareness and understanding of the importance of a healthy diet.
2. **Food aid:** Providing food aid and support to vulnerable populations, such as children and older adults, can help to ensure they have access to nutritious food.
3. **Agricultural development:** Investing in agricultural development can help to increase the availability and accessibility of nutritious foods.
4. **Poverty reduction:** Addressing poverty can help to improve access to food and reduce the risk of malnutrition.

Treatment of Malnutrition: The treatment of malnutrition depends on the underlying cause and severity of the condition. Treatment options may include.

1. **Nutritional supplements:** Supplements such as vitamins, minerals, and protein can help to address

nutrient deficiencies.

2. **Changes to the diet:** A healthcare professional may recommend changes to a person's diet, such as increasing the intake of nutrient-dense foods.
3. **Medications:** Medications may be prescribed to treat underlying medical conditions that are contributing to malnutrition.
4. **Nutritional support:** In severe cases of malnutrition, nutritional support may be necessary, such as enteral or parenteral nutrition, where nutrients are delivered directly into the blood stream.

Review of literature

Falkner (1991) ^[26] under nutrition impairs Physical, mental and behavioural development of millions of children and is a major cause of child death.

Agarwal, (1999) ^[1] study reported that malnourishment was widely prevalent in the rural and urban areas of school children due to poverty, ignorance, unhygienic condition that causes infection. Nutritional deficiencies like anemia, vitamin A deficiency, and under nutrition were common even in higher socio-economic status. At this age, this serious problem needs more attention otherwise there may be a problem in the future. This might be useful if the periodical clinical examination is adopted for children.

Briefel *et al.* (1999) ^[3] Nutrition plays an important role in development from birth to old age. Environmental factors also affect children's nutritional and health status. Proper nutrition affects their behaviors both in the short and long term.

Smith LC, Haddad LJ (2002) ^[21] Child Malnutrition is one of the significant issues of any country. In the least last 30 years around the world number of malnourished children has continuously increased which causes growth failure, delay in cognitive development and behavior development, and increasing morbidity and mortality rate.

Gopal Das Tara (2003) ^[27], Improved Effects of school Meal with Micronutrient supplementation and dewormed Frontline, August 1.

Gopal Das (2003) ^[27], Indian children are undernourished and suffering from Iron deficiency, Vitamin A, Riboflavin, Vitamin C, and Iodine deficiencies. They also suffer from diarrhea skin infections etc.

UNICEF (2008) ^[22] report says, one of the main causes of child mortality worldwide can be attributed to under nutrition, and is estimated to cause at least half of all child deaths.

UNICEF (2008) ^[22] Moreover, 17 million children under 5 were severely wasted. India is one among the many countries where malnutrition is a major underlying cause of child mortality and developmental challenges.

Onis and Mercedes *et al.*, (2015) ^[28] under nutrition is a major health problem in developing countries. In India poor Nutritional status of children is a condition of noiseless disaster, thus they need more attention than ever before.

N Chattopadhyay, M Saumitra (2016) ^[14] under nutrition, which is an important determinant of maternal and child health, has significant negative effects on brain and cognitive development of children.

Khara (2018) ^[11] under nutrition, in particular, in early life results in impairment of cognitive development, irreversible physical and physiological destruction, and puts children at higher risk of morbidity and mortality.

Objective of Research work

1. To know the growth pattern and development of children.
2. To know the nutritional deficiencies of children.

3. To assess the nutritional status of children.
4. To know the impact of malnutrition on child health.

Methodology

This present article based on information collected through secondary sources and analysis made on that basis to get valuable facts.

Materials and Analysis

Child is the important part of the population. In India 19% (190 million) of the growing child which is suffering from deficiency, or excess of energy-protein and micro nutrients causes effects on tissue/ body shape, size, composition, function. Nutrition plays an important role in a child's growth and development, under nutrition among children in low and middle-income countries, with a focus on diarrhea and pneumonia, the commonest childhood life-threatening infections worldwide.

In addition to an increased frequency of infectious disease, children with malnutrition are at significantly higher risk of more severe disease and suffer significantly more acute and long-term morbidity and mortality when infected.

In addition to a diet low in energy or specific nutrients, a wide range of antenatal and postnatal environmental exposures, acute infection, chronic illness or psychosocial neglect may result in malnutrition.

Malnutrition is treatable, but some effects can linger. Effects of severe under nutrition, such as blindness from vitamin A deficiency, soft bones from vitamin D deficiency and stunted growth from protein-energy under nutrition in children may not be reversible, even after rehabilitation.

Due to poverty one third of children are malnourish. In India 21% of total population (207 million) is suffering from hunger and under nourishment. Children with poor eating habits don't get the amounts of nutrients they need for healthy growth and development. This can lead to being underweight or overweight. Children who are poorly nourished tend to have weaker immune systems, which increases their chances of illness. Malnutrition is still un-trodden challenge in all states of India. Malnutrition has multiple causes, but the burden of disease and deficient and poor-quality diet are major reason in India.

Many life style factors and poor eating habits acquired during childhood can lead to serious disease later in life. The nutrition status of children is worst. To decrease the incidence of malnutrition in children, the present research study has been structured to analyze the health, nutritional status, growth and development of children and to find out the role of nutrition.

Facts and findings

Malnutrition in India poses a significant threat to the health and well-being of children. Poor nutrition weakens their immune systems and this leaves them vulnerable to diseases, reduces their physical growth and impairs development. The consequences of malnutrition can be devastating and long-lasting and can affect their futures.

Lack of access to nutrient-rich foods is a major contributor to malnutrition. Insufficient diet, inadequate intake of essential vitamins and minerals and unhygienic food practices aggravate the problem. Poverty, limited access to clean water and the lack of education about proper nutrition exacerbate the situation.

Children are more vulnerable to macro- and micronutrient deficiencies caused by high demand for food during their

years of growth. The effects of malnutrition in children under the age of 5 years include underweight, stunting, wasting with or without oedema (previously known as marasmus and kwashiorkor, respectively) and even death. Children with poor eating habits don't get the amounts of nutrients they need for healthy growth and development. This can lead to being underweight or overweight. Children who are poorly nourished tend to have weaker immune systems, which increases their chances of illness.

Therefore, this study will be useful in determining the burden of malnutrition under nutrition and over nutrition. The present study demonstrates the multiple risk factors for childhood malnutrition, encompassing sectors other than health alone like social and economic sectors, requiring multi sector approach to fight against the silent killer of childhood malnutrition. This study will help the policy makers to formulate the nutritional intervention and promotion programs to reduce the prevalence of malnutrition. Thus, the present study with the above concern is necessary.

Conclusion

Malnutrition is a major public health problem. Low socio - economic status of family is the main factors that contribute bad nutritional habits. Micronutrients deficiencies especially iron causes damage to neurological structure that will ultimately lead to negative effects on psychomotor affective and cognitive development. A low level of micronutrient intake can lead to disease disability and increase the risk of morbidity and mortality. Malnutrition must be seen as a complex that involves not only food but also lack of Nutritional education. Malnutrition is a serious condition that can have long-term health consequences. It is caused by a range of factors, including poor diet, digestive problems, and mental health conditions. Treatment options include nutritional supplements, changes to the diet, medications, and nutritional support. Prevention strategies include education, food aid, agricultural development, and poverty reduction. It is expected that the result of this study will help to understand the actual requirements in the area for such children and will help policy makers to take specific decision.

Suggestions

Maternal education had significant effect on child's nutritional status. So, there is a strong need for their formal and informal education regarding available services for their children and make those services acceptable too.

The compromised nutritional status of the mother is a direct determinant in producing a low birth weight baby, thus encouraging the improvement in the nutritional status of women during ANC period is essential. So, the Ante Natal Period should be best utilized by all health care providers at all level of services being provided.

Faulty feeding practice worsens the nutritional status of children. Therefore, mothers need to be educated regarding the benefits of exclusive breast feeding during initial 6 months of life and the importance of initiation of complementary feeding at 6 months of age.

Health workers should ensure the complete vaccination of all children under five years in their respective areas.

Health policies should be aimed at improving both the food aspects as well as social and educational support. By addressing the underlying causes of malnutrition and promoting healthy eating habits, we can work towards reducing the incidence and impact of this condition on global health.

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