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Review Article

Malnutrition in Children - Diagnosis and Management

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Abstract

Malnutrition is a nutritional imbalance that is mostly observed in children below five years of age. The paper describes the definition of malnutrition and the forms in which it manifests itself, such as underweight, stunning, wasting, and overweight. A precise examination of the condition is examined by identifying different indicators considered when determining whether a child is suffering from malnutrition or not. Set standards described by WHO, which are an indication of a healthy child is discussed as well, the methodology of treating children with malnutrition conditions, especially severe acute malnutrition (SAM) with recommendations and conclusions are discussed in detail in the paper. The World Health Organization defines childhood malnutrition involves a dietary deficiency caused by the lack of food, an eating disorder or a chronic health condition that hinders the absorption of the necessary nutrients required by the body. This is a threat because it contributes to the deaths of 45 percent of children below the age of 5.

Much of the research on the effects of malnutrition is carried out in third world countries, where economic and political stability determines the citizens' access to basic resources, such as food and water. 462 million people have stunted development due to poor nourishment and poor diets, with 200 million of them being children, and this indicates that these countries may have no human capital in the near future [1].

Addressing malnutrition requires multiple actions that can be spearheaded by the various sections of public health. Academic institutions play a role in carrying out research, but there is still need for coordination on the part of the UN agencies and the various governments of affected countries [2].

Keywords: *Malnutrition; Public Health; Diet; Access*

Introduction

Malnutrition is the lack of having excess nutrients in the body. It is categorized into two groups, namely undernutrition and overweight. undernutrition refers to a lack of some nutrients in the body, and it includes others conditions like stunning, which is the occurrence of a child with low height for age, wasting which refers to condition of having low weight for height, micronutrients insufficiencies which refers to lack of essential elements and vitamins and underweight which is a condition of low weight for age [3].

Overweight is a condition where the individual is more substantial than average. According to research about 1.8 billion people globally are overweight and about 463 million are considered under weight. The study also found out that about 42 million children are obese, about 160 million are stunted growth and about 49 million are considered wasted.

According to the WHO report [4], stunting in children has been decreasing in all the regions since 2000 [4]. More than one in five children under the age of five are reported to be stunted by the year 2018.

In April 2016, the UN General Assembly resolved to adopt the UN Decade of Action on Nutrition 2016 – 2025, whose aim is to catalyze the policy commitments that would result in measurable actions that address the issues related to malnutrition. Larson-Nath and Go day state that malnutrition predisposes children to other diseases. The reasons for this are multifactorial and may possibly be associated with other underlying diseases [5]. This case study analyzes the various causes of malnutrition, treatment options and other ways of preventing future cases.

Examination

Child malnutrition contributes to high mortality rates in children under the age of 5 because they are more susceptible to disease and infections slow down their recovery. Children who are malnourished do not reach optimum height and are plagued with weight loss as they grow up, with the effects being long term. Ahmed [6] reiterates that stunted children lose 3.2 centimeters in their adult height for every decrement in length/height-for-age score at age 2. This, among other negative impacts, leads to low socio-economic achievement in their lives. Every year, malnutrition and its effects cause the death of 300,000 children who are younger than 5 in developing countries, and more than half of children's deaths across the globe.

Interactions between infection and undernutrition can create a lethal cycle of not only deteriorating nutritional status but also worsening illnesses as the individual grows older. During the first 1000 days, poor nutrition also leads to stunted and impaired cognitive ability as well as reduced performance in school. The measures of child nutrition are useful in tracking development processes, and this determines whether the Sustainable Development Goals remain attainable or not, especially the second goal, which is to 'end hunger, achieve food security and improved nutrition, and promote sustainable agriculture'. Lenters, Wazny and Bhutta [7] state that the management of acute malnutrition has political and economic contexts that have to be addressed. The predictors of malnutrition are often in the form of illnesses, which when ignored, may result in dire effects.

Physical signs and symptoms can detect malnutrition disorders. These symptoms include:- slow growth rate and love development which are used to compare a child with the standard growth standards. The growth standards indicate the paleness of the skin, the membranes covering the eyes and mouth, nails and palms surface, protein deficiency can be detected by signs such as the browning of the hair and general physical appearance. Several indicators are considered as well in determining whether a child is malnourished [8]. The first one is clinical indicators, which involves examining the child for marasmus and Kwashiorkor, goiter and exophthalmia.

Marasmus is manifested in children in various ways, which include loss of body mass index where the child loses body fats and muscle tissues. A child with marasmus shows a slow growth rate and presents a condition called stunted growth. It can be also examined by symptoms such as dizziness, lack of energy dry skin and brittle hair [4], marasmus represent a wasting type of malnutrition. Kwashiorkor can be examined by observing the child physical appearance such as bulging abdomen, low weight, loss of appetite and yellow-brown hair.

The second indicator is referred to anthropometric, which involves taking the measurement of the body of the child and assess if the child is malnourished. The measurement of height, weight, mid-upper arm circumference, and waist circumference are determined and compared to the average of standard measurement provided by the health organization, for height examination, the height with age, weight with height, and body weight are taken, in weight measurement, birth eight and weight for the age of the child are made [9]. Another indicator of malnutrition in children involves the use of biochemical tests and techniques, the level of protein, albumin, transferring and the retinol- binding protein is used to measure malnutrition. Albumin is mostly used to assess protein stores and the result are recorded.

Discussion

WHO defines malnutrition as a cellular imbalance caused between energy and nutrients and the body's requirements to carry growth and other related functions. A balanced diet is necessary for a child's development, but in their absence, the child manifests non-communicable diseases, micronutrient deficiencies and the wasting of body mass. This case can either refer to undernourishment or overnutri-

tion. Undernutrition sets in when there is an intake of insufficient proteins and calories, while overnutrition is the excessive intake of nutrients, more than the body requires for metabolism and development. If it occurs during pregnancy or under two years, the effects of undernutrition may be irreversible, marked by stunted mental and physical development. Nutrition levels are a determinant of both child and maternal health and accounts for up to 10 percent of the world's disease burden and breastfeeding or pregnant women and children under the age of 5 are more likely to develop malnutrition [10].

Growth standards indicate the measurement of a child using weight, height and age. WHO and UNICEF have set the standard for the weight in comparison to the height of not more than three standard deviation for children with acute malnutrition [4]. A child below the WHO cut-off and UNICEF reference are characterized by a high mortality rate compared to the ones above the standard and have a high weight when under a therapeutic diet in comparison to other diet and leads to faster recovery. According to WHO, the arm circumference in comparison to age is 115mm, ant child below that cut off is considered to have acute malnutrition.

Kwashiorkor is a clinical sign which is indicated by edema in children. According to WHO, survey deduced from hospital records in the last ten years showed less than 1% of edema prevalence in most countries worldwide. Countries in the south and central Africa showed high rates of edema. Yemen, DRC, and Zimbabwe reported prevalence rates 1 - 2%. The results were not very accurate as the children examined and the number of surveyed was limited. In Zimbabwe, only one survey was conducted, while more than 190 investigations were performed, in DRC, Chad, and Somalia. A study done in Bwamanda in DCR showed that clinical incidences of marasmus were high in boys than in girls during the dry season [3], the rate increased steadily from 5 - 11 months age category, the recovery of the marasmus condition to normal status occurred in less than three months with a recorded recovery rate of 62.2 - 80.3%.

Malnutrition is a problem that hinders the attainment of the SDGs, because poorly fed children lack the mental and physical capability to function on their own. It leads to cardiac dysfunction, oral hygiene problems and anemia [11].

Treatment of malnutrition

The treatment of malnutrition needs to address all underlying conditions and to replace the nutrients which may be missing from the body. This is, however, only possible upon seeking professional medical opinion. According to Lelijveld, there is an apparent absence of guidance on what form of treatment would work for moderate acute malnutrition (MAM), which is often the case in extreme clinical diagnoses [12]. It remains unclear whether counseling or using food products is effective, or the combination of both methods.

- **Dietary supplements and changes:** Dieticians have a role in creating a diet plan which will ensure that the child gets sufficient nutrients. Healthier, balanced diets are highly recommended, especially if the child is under the age of two. This includes the consumption of fortified foods and drinks that are high in nutrients. A study conducted in Niger established that dietary diversity remains the best response to treating malnutrition. This is not only safe but also cost-effective, especially when using traditional or organic foods. This helps in minimizing medical costs and improving the child's condition [13]. However, in third world countries that produce their own traditional foods, malnutrition is caused by the excessive consumption of one type of food, for instance, carbohydrates or vitamins, thereby leading to protein deficiency. Children under the age of five should be breastfed regularly, if the mother is able to. In addition, the mother should consume foods that are high in protein when she is breastfeeding. If the baby is past weaning, protein-rich foods should be introduced.

- **Support and care services:** Parents who have malnourished children receive care from social care officials and other visitors who can help in the preparation of food. An occupational therapist also plays a role in identifying the problems with their diets. Wherever possible, material support should be provided for these families so that they can better manage their child's nutritional intake. Rahman [14] further states that seeking dietary support during and after pregnancy is dependent on the mother's level of education and her socio-economic status. This is what determines whether she will visit the hospital and taking into consideration the dietary requirements for her child.

Prevention

Preventing malnutrition requires the consumption of a healthy and balanced diet. This is not only vital for the body organs, but it also helps in the proper development of growing children. This involves eating foods from all the main groups, and especially plant and animal protein.

- **Improving the healthcare system:** Efficient systems are necessary in preventing the rising cases of malnutrition in children. This can be done by making available information regarding feeding and weaning. Smita and Rathore [15] surveyed with 100 mothers in a rural setting in India. It was discovered that deep-seated customs and beliefs prevented them from adequately feeding their children. The role of healthcare facilities then is to not only provide diagnosis but to carry out sensitizations on the advantages and necessity of exclusive breastfeeding, of feeding children with nutritious foods and how to maintain proper levels of sanitation.

- **Early detection:** A properly documented growth chart can help in the early detection of malnutrition. At a given time, emphasis is placed on the velocity of growth rather than the child's weight. When the developmental days remain uncorrected, the higher the chances of irreversible damage, therefore, the intervention has to take place during pregnancy and the child's first 1000 days. The presence of a flat curve on the child's chart is an indication of a problem, and can be arrested and handled. The maintenance of this chart is done using anthropometric indices such as chest circumferences, weigh, and height mid-arm circumference, among others [16].

- **Nutritional supplements:** Vulnerable groups that are biologically vulnerable are the target groups for efforts made by governments to guarantee health. Infants and school-going children, pregnant women are provided with supplements. The main objectives of providing children with supplements is to accelerate their physical growth and to rehabilitate malnourished children. In pregnant women, supplements prevent anemia and improve calorie intake, thereby minimizing the possibility of having a malnourished baby [17].

Conclusion

Malnutrition in children is characterized by the lack of appetite for either drink or food, low body temperature, loss of muscle and fat and a prolonged healing time for wounds. In some cases, they have a lower immune response to illnesses. Child malnutrition affects not only affects their educational achievements but also their long-term ability to be economically productive. Mental impairment that is caused by iodine deficiency in the system is not only irreversible but is also directly linked to loss of productivity [18]. Maternal malnutrition raises the risk of poor pregnancy, obstructed labor and underweight babies. Growth-retardation is also a possibility after birth, with these children become more susceptible to illnesses as they grow up.

There are preventive measures against malnutrition, but it requires the input of both the mother and the healthcare providers. Such cases are rampant in third world countries, but cases of obesity are more prevalent in developed countries. Treating malnutrition is made possible through the consumption of foods from all food groups, keeping in mind to use locally available products.

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