

## Special Article - Malnutrition

# Child Malnutrition is an Alarming Challenge Face by Sudanese's Children

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Received: June 06, 2019; Accepted: July 05, 2019;

Published: July 12, 2019

## Abstract

Child malnutrition has become a public health threat, and there was an alarming increase in prevalence among Sudanese children. Also, anthropometric measurements (Mid-upper arm circumference MUAC, weight and length/height) was practical measurements tools for assessing children nutrition status. Therefore, the current mini-review highlighted that malnutrition is considered multifactorial, ranging from lower socioeconomic, poor nutrition, lack of mothers' knowledge in complementary feeding practices. Due to this reason, the prevalence of global malnutrition, moderate malnutrition and severe malnutrition were continued reporting among Sudanese children. Therefore, the study recommends that social determination, improvements of child feeding, and better maternal education are needed to maintain malnutrition at hospital and community level. Therefore, Child malnutrition is an alarming challenge. For this reason, better health intervention throughout collaboration with the governmental and nongovernmental agency to enhance the research towards nutrition and child health status are still needed in both urban and rural area of Sudan that may be a step forward in attempts to break the cycle of malnutrition among Sudanese's children.

**Keywords:** Child malnutrition; Sudan; Mid Upper Arm Circumference (MUAC); Severe Acute Malnutrition (SAM); Moderate Acute Malnutrition (MAM)

## Abbreviations

MUAC: Mid Upper Arm Circumference; SAM: Severe Acute Malnutrition; MAM: Moderate Acute Malnutrition; WHO: World Health Organization; WFP: World Food Programme; IDP: Internally Displaced People; PEM: Protein-Energy Malnutrition; MSF: Medicine Séance Flaunter

## Introduction

### Background

Sudan and others sub-Saharan Africa is the most nutritionally insecure region in the world. The issues of severe malnutrition are mainly reported as a problem in young children and pregnant women. The enormous factors contributed to this starting from poor infrastructure, limited resources of compounded with conflict, infectious diseases, and poor access to health services. Despite these challenges, many African countries were making progress towards food and nutrition security. However, child malnutrition has become a significant public health issue in the region [1]. In addition to the ethnic, culture, lower socio-economic status, urbanization, seasonal food shortages, which are significant influences on the nutritional status [1]. About 45% of child deaths globally are due to malnutrition. In developing countries such as Africa and Asia, a high proportion rate was continuously reporting [2]. In Sudan, approximately 31% of children under the age of five are moderately or severely underweight. The mortality and morbidity were continuously reported in the area of West Kordofan State [3]. Furthermore, the prevalence of malnutrition was shown increasing among Sudanese during the last decade. On the other hand, the protein energy malnutrition was

considered the major cause of morbidity and mortality in children in sub-Saharan Africa [4].

Nutrition means "the combination of the process by which the living organisms receive and utilize food that is necessary for the maintenance of its functions and the growth status of the children.

Malnutrition generally states both to undernutrition and over nutrition, but in this guide, we use the term to refer solely to a deficiency of nutrition [5]. Medicine Séance Flaunter (MSF) in 2007 defines malnutrition as "diseases linked to lack of food in terms of quantity or quality, which leads to children to stop growing and lose their weight" [6]. Where the term malnutrition refers to undernutrition, malnutrition can be divided into two different types, including Severe Acute Malnutrition (SAM) and Moderate Acute Malnutrition (MAM).

### Causes of malnutrition

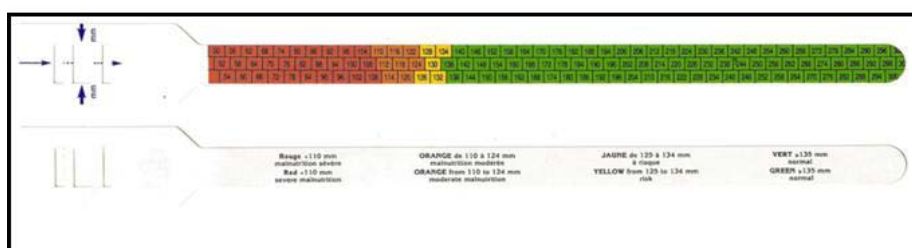
The world declaration on nutrition identified the root cause of malnutrition as poverty, deprivation, social inequality, lack of education [7]. Malnutrition is undesirably physical or disease conditions related to nutrition that can be caused by eating too little, too much or an unbalanced diet that does not contain all nutrients necessary for good health for children. United States Agency International Development report highlighted the leading causes for malnutrition is resulted in an inadequate household food security, inadequate dietary intake, and poor health, besides to other infectious disease [8].

### Epidemiology of malnutrition in Sudan

Generally, in Africa and particularly in Sudan, malnutrition was

**Table 1:** Nutritional indices.

Nutritional Index	WHO	WFP
Weight-for-height or length (WFH)	WHO reflects recent weight loss or gain and so the best indicator to determined wasting and an individual's recent nutrition is WFH WFH is also useful when age is unknown	WFP usually preferred indicators for nutrition survey in emergencies WFP used as the selection criteria for selective feeding programmes
Height-for-age (HFA)	HFA reflects skeletal growth	HFA is best known as an indicator of stunting
Weight-for-age (WFA)	WFA is a composite index as it reflects a combination of both wasting and stunting. It is used generally as a measure of underweight	WFA growth charts are used to monitor the weight gain of children in mother and child health programmes ('Growth monitoring on Road-to-health' cards)
Mid-Upper-Arm Circumference-for-age or length (MUAC-For-age/or height.	WHO recommended using reference values to transform arm circumference measurements into MUAC –for-age/or height This is now considered preferable to unadjusted arm circumference measurement.	MUAC for age or length /height can be used as quick, simple but less accurate methods of initial screening when scales are not available

**Figure 1:** Rapid diagnosis of malnutrition for children using Mid Upper Arm Circumference (MUAC) measurement.

as a result of increased in the mortality rate. Therefore, it required a governmental policy, better nutritional education for parents' that might help to reduce the incidence rates. According to the latest WHO data published in 2017 showed that the malnutrition deaths in Sudan reached 1,446 or 0.54% of total deaths. The age adjusted death rate is 2.80 per 100,000 of the population [9].

#### Factors contributed to the increased of malnutrition rate

Malnutrition in all its forms is still a major public health problem in the world, especially in developing countries, such as Sudan. It has been defined as the cellular imbalance between the supply of nutrients, energy and the demand of the body for growth, maintenance and specific functions. Malnutrition consist of multi-factorial problems [7-13].

Dietary and environmental factors, lack of shelter, poor personal hygiene and poor environmental sanitation, outbreaks of diseases, ongoing war, drought, famine and shortage of food were highly contributed in the increased risks of malnutrition in children [2]. Moreover, an article published by Samir and Hashim in 2011 indicated that the most affected children with malnutrition in Sudan are those who belong to families living within the limited access to resources and parental education [14,15]. However, the nutritional health education and health services over the country remain a challenge not only for Sudan but also in other developing country [16].

#### Nutrient and malnutrition

Understanding the nutrition's impacts of healthy people as they grow, develop, and function through the stages of life, where an inadequate intake of an essential nutrient, if prolonged, results in obvious deficiency diseases. Marginally deficient diets produce indirect changes in behaviour or physical condition of the children. If the optimal intake range is exceeded usually by overdoses of

supplements, mild to severe changes in mental and physical functions occur, depending on the amount of the excess nutrient involved [17].

Micro nutrition included all vitamin and minerals required in only tiny amounts, then they are the less essential for life and needed for a wide range of body function and process. Micronutrient deficiencies are widespread and affect the number of people in developing countries; approximately 200 million people worldwide are suffering from some micronutrient where micronutrient is presenting health challenges [18]. Such as a situation in Sudan iodine, iron and vitamin are most micronutrient deficiencies with high health consequences. The evidence shows that Iodine deficiency has a significant effect on children and women. Moreover, 22% of Sudanese school-age children have a goiter (1997, national nutrition survey). National household iodized salt consumption in Sudan is 9.3% ( $\geq 15$  PPM) according to SHHS 2010. Salt iodization; is the recommended strategy for ensuring adequate human iodine intake. The adequate iodized salt content of iodine is more than or equal 15 PPM (part per million), if the iodine content is less than 15 PPM at iodized salt consumption, it will not prevent iodine deficiency disorder in the population [19].

In North Darfur State, during the early 2017 food security, including the availability and adequacy of food were increased in prevalence [9]. Recently, according to the Ministry of Health (MOH) it was declared that the rapid growing malnourished in Sudan, and the stunted rate has been increased from 33% to 35% from the year 2006 to 2010, and again to 38% in 2014 [20].

#### Challenge face by malnutrition in Sudan

Prevention and control of malnutrition are further improving the health and nutrition status among Sudanese children, It needs a huge vital efforts by Federal Government of Sudan to control and bring health well-being for Sudanese Children through engaging

in preventing and treating malnutrition in both emergency and development settings, however strengthening with coordination and standardization of efforts is required to ensure wide scale of service provision to beneficiaries all across the rural and urban area of Sudan [21].

### Measurement of malnutrition standard in Sudan

Anthropometry measurements has become a practical tool for evaluating the nutritional status of children in developing countries such as Sudan. Musa et al. 2014 [10]. The anthropometric measurements (mid-upper arm circumference MUAC, weight and length/height) were reported as considered practical tools for measurement. Child body weighs, Length/height, and mid-upper arm circumference MUAC was main nutritional measurement used at the primary health care to assess the malnutrition in children.

The measurement was taken on the left arm following the guideline reported by Musa et al., 201 at the middle point between the elbow and the shoulder while the arm was relaxed and Edema Clinical evaluations of the malnourished children were undertaken to check the presence of severe Protein Energy Malnutrition (PEM) [1,10].

On the others hand, World Food Programm (WFP) indicated that the measurement of nutrition was a focus on children from 6 months to five years old, as they are the most vulnerable in nutritional deficiency. Adults are also some times included in assessment in order to assess the severity and extent of malnutrition through the population. The anthropometry was used as an indicator of the nutritional and health status of children, especially among adults in developing countries World Health Organization (WHO) in 1995. Where recently Mid-Upper-Arm Circumference MUAC & BMI according to World Health Organization and World Food Programme (WHO/WFP) defined malnourished when the arm circumference was >13.5cm, mild malnutrition (12.5-13.5cm) and moderate malnutrition (12.0-12.5cm), respectively. WHO and WFP nutritional indices and cut of point classification status are reported in Table 1 and Figure 1.

Overall health organization, including governmental and non-governmental organization such as MSF and WFP, UNICEF is using MUAC for the rapid diagnosis of malnutrition. Moreover, each organization has their cut off point such as in early WHO, 2008 classified child malnutrition into three groups Normal (>13.5) cm, Moderate (12.5-13.5) cm, and severe malnutrition (< 12.5) cm (Source: www.who.org, 2008). In Sudan, the health center was using the National Nutritional and health standard [1].

### Management and control malnutrition

To prevent malnutrition, people need to consume a range of nutrients from a variety of food types. There should be a balanced intake of carbohydrates, fats, protein, vitamins, and minerals, as well as plenty of fluids, and especially water. People with ulcerative colitis, Crohn's disease, celiac disease, alcoholism, and other health issues will receive appropriate treatment for their condition.

### Ways for prevention and control malnutrition

As previously reported by WHO the preventing of malnutrition cycle are hard because it needs more health intervention programme, starts from education to livelihoods and environmental management

problems, this complication can be overcome throughout the better understanding in the break of malnutrition cycle.

## Conclusion

Childhood malnutrition is a major issue in Sudan, particularly in South Kordofan, Blue Nile, and Jebel Marra areas. For prevention and control, we require strong intervention due to the highest prevalence rates. The increased in the prevalence rate is due to the lack of proper quality of food, lack of receiving an average of 2-3 meals per day, the lack of mothers' knowledge on feeding practices, low socio-economic status, and increased poverty among the vulnerable groups. Malnutrition it is the most common nutritional disorder in developing countries, and it remains one of the most common causes of morbidity and mortality among children worldwide, due to the increase of poverty as leading cause of malnutrition beside the other factors including breastfeeding habits, low education, climate changes, and alteration in food production, cultural and religious towards child feeding. Therefore, an effective interventions program me should be require accompanying nutrition-education campaigns among Sudanese Children.

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