Original Research Article

Prevalence of malnutrition among children under five years old in Khartoum State, Sudan

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A B S T R A C T

Introduction: Malnutrition 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.

Aim: To identify the prevalence of malnutrition (underweight, stunting and wasting) among children under 5 years old living in Khartoum state, Sudan.

Material and methods: A cross-sectional community-based descriptive study was conducted, to collect primary information from households using a scientific questionnaire, anthropometric measurements (mid-upper arm circumference – MUAC, weight and length/height), and clinical evaluations of the malnourished children to check the presence of severe protein energy malnutrition (PEM).

Results and discussion: The results showed that socioeconomic factor, poor nutrition, and mothers’ knowledge and feeding practices led to increase in the prevalence of malnutrition. MUAC indicator showed that 20.9% of children were badly nourished and 79.1% of the children were well nourished. In addition, to poor economic situation, the study found that about 15.4% of children were underweight, 8.8% were moderate underweight and 6.6% were severe underweight. The prevalence of wasting was 21.1% (12.3% moderate and 8.8% severe) and the prevalence of stunting was 24.9% (15.1% moderate and 9.7% severe). The World Health Organization standard showed that the prevalence of global malnutrition, moderate malnutrition and severe malnutrition was 12.8%, 8.0% and 13.6%, respectively. The National Center for Health Statistics reference showed that the prevalence of global malnutrition, moderate malnutrition and severe malnutrition was 23.1%, 10.2% and 12.9%, respectively.

Conclusions: We conclude that improvements in child feeding, and better maternal education are needed to maintain the children’s nutritional status.

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1. Introduction

Malnutrition 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. Malnutrition affects physical growth, morbidity, mortality, cognitive development, reproduction, and physical work capacity, and it consequently impacts on human performance, health and survival.1,2 It is estimated that 150 million children under 5 years are underweight and more than 20 million suffer from severe malnutrition.3,5 About 47 million children under 5 years are stunted in the sub-Saharan Africa, whereas in the Eastern and Southern Africa 24 million are stunted.6 Stunting is an indicator of past growth failure, which is a sign of poor nutritional history. It is associated with a number of long-term factors including chronic insufficient protein and energy intake, frequent infection, sustained inappropriate feeding practices and poverty.7 Wasting indicates current or acute malnutrition resulting from failure to gain weight or actual weight loss.7 In Sudan, 31.0% of children under 5 years are moderately or severely underweight, 32.5% suffer from moderate or severe chronic malnutrition and 14.8% suffer from global acute malnutrition.8 Also, in Khartoum state the prevalence of malnutrition among 6–59 months old children was 11.8% for moderate acute malnutrition and 7.3% for severe wasted.9 The problems of increased prevalence of malnutrition were related to poor sanitary conditions and inadequate food intake.10 Mother’s education was found to be the strongest factor associated with malnutrition among the children under 5 years of age.11

In Sudan the nutritional status for children under 5 years old depends on the living standard of the population and the households’ income. Children who belong to families having limited access to resources are mostly children affected with malnutrition.12 Furthermore, a child’s nutritional status can be affected by poor economic situation and socioeconomic, demographic, and cultural factors.13 Moreover, to maintain nutritional status and, in turn, for better health growing of the children’s, both maternal education and nutrition are needed.11

2. Aim

The objective of the present study was to measure the prevalence of malnutrition in the three forms: wasting, stunting and underweight (severe and moderate for each type) and to identify the socioeconomic characteristic of households.

3. Material and methods

3.1 Study area

Khartoum state in Sudan covers 22 122 km² with an approximate population of 7 152 102. The state is divided into seven localities, al Khartoum, al Khartoum Bahri, Omdurman, Jabal Awliya, Sharq Alnil, Ombada and Karari. The current study was conducted in Dar El Salam in Ombada locality with a total population of 582 661 living in 52 blocks; the recommended sample size for the assessment according to households number was 505 households.

3.2 Sampling procedures

A cross-sectional descriptive study was designed to collect primary information from households using a scientific questionnaire. The questionnaire covered demographic data, birth data, family size, gender, parent’s education and occupation, quality of food eaten by children, number of meals eaten per day and source of income of the study population. In addition, physical appearance of people and their living conditions were observed; interaction between people and their activities were highly considered.

3.3 Anthropometric measurement

Anthropometric measurements (mid-upper arm circumference – MUAC, weight and length/height) were carried out according to the nutrition guidelines method (MSF14, Gibson15).

3.4 Body weight

Body weight was measured using a hanging baby scale with a 15 g capacity (mechanical baby hanging scale, capacity up to 15 kg or 25 kg SECA310) for children unable to stand. While for older children a mechanical dial weighing scale, made in Japan, with capacity of 130 kg was used. All children were weighed with light clothing, without shoes, to the nearest 0.1 kg; measurements were double-checked. The scales were checked for accuracy before starting the survey and after, and then rechecked periodically.

3.5 Length/height

Heights/lengths were carefully measured using an inelastic measuring tape to the nearest 0.1 cm. Children older than 24 months (height more or equal to 85 cm) were measured while standing, and those less than 24 months or less than 85 cm height were measured while lying down.

3.6 Mid-upper arm circumference

MUAC was measured in centimeters using children’s (shakir insertion) and was recorded to the near 0.1 cm. The measurement was taken on the left arm, at the middle point between the elbow and the shoulder while the arm was relaxed.

3.7 Age

Age was recorded using Medecines’ Sans Frontieres method; if birth dates have been recorded on a health card or immunization card, determination of age is simple. In such cases, the date of birth is directly recorded onto the questionnaire in order to avoid mistakes in calculating the age. If birth dates are not recorded, a local calendar of events is used. The mother is asked whether the child was born before or after certain major
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