



Science

## **PREVALENCE OF MALNUTRITION AMONG CHILDREN UNDER 5 YEARS IN KASSAB AND FATABRNO CAMPS AT KUTUM LOCALITY, NORTH DARFUR STATE, SUDAN**

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### **Abstract**

Malnutrition it's one of main problem that lead to death among children under 5 years. There is a high nutritional requirement for children under 5 years of age because they are undergoing a period of rapid growth. This descriptive cross-sectional study saw conducted in Kutum locality – North Darfur State aimed to assess the nutritional status of children under 5 years at Kassab and Fatabarno IDPs camps, in addition to assess the others factors influence child feeding practices. To achieve these aims, a survey was carried out on 101 children, age zero to 59 months in study area. Data were collected by anthropometric measurement as well as direct interview with mothers to collect certain socio-demographic factors which were associated with the nutritional status of study population. Age was determined from mothers and weight and height were measured using standard techniques. After analyzed of obtained data by SPSS version 20 the main results are: prevalence of malnutrition in Kassab and Fatbarno IDPs camps is 15.8%, of which 6.6% is moderate acute malnutrition (MAM) and 8.9% is severe acute malnutrition (SAM), 76% of the mothers with normal children were started complementary feeding after 6 months while 69% of mothers with malnourished children were started complementary feeding before 6 months, Most of the children identified with malnourished either SAM or MAM were in the age group between 12 – 24 months representing by 63%. Then the study recommended that: raising awareness of mothers about importance of breast feeding for infant to improve nutritional status of their children, encourage complementary feeding and begin it in right age according to WHO recommendations.

**Keywords:** Malnutrition; Breast Feeding; Kutum Locality; Complementary; Growth; Nutrients.

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## 1. Introduction

WHO defines malnutrition as "the cellular imbalance between supply of nutrients and energy and the body's demand for them to ensure growth, maintenance, and specific functions. Malnutrition can also be defined as the insufficient, excessive or imbalanced consumption of nutrients. Several different nutrition disorders may develop, depending on which nutrients are lacking or consumed in excess (WHO, 2013).

Malnutrition is a man-made disease caused by many factors, including economic condition. Thus, it has been defined as —weight -for age as below the median minus two standard deviation|| per the National Centre for Health Statistic, USA (NCHS) reference population. Also, it has been defined as —pathological state resulting from relative or absolute deficiency or an excess of one or more essential nutrients (Park, 2007).

Moderate malnutrition (MM) is defined as a weight-for-age between -3 and -2 z-scores below the median of the WHO child growth standards. It can be due to a low weight-for height (wasting) or a low height-for-age (stunting) or to a combination of both. Similarly, moderate wasting and stunting are defined as a weight-for-height and height-for-age, respectively, between -3 and -2 z-scores MM affects many children in poor countries.

Children with moderate malnutrition have an increased risk of mortality and MM is associated with a high number of nutrition related deaths. (Essa, 2012).

Severe acute malnutrition (SAM) is defined by a very low weight for height (below -3z scores of the median WHO growth standards), visible severe wasting, or by the presence of nutritional oedema (WHO, UNICEF and WFP, 2007).

Protein-energy malnutrition (PEM), first described in the 1920s, is observed most frequently in developing countries but has been described with increasing frequency in hospitalized and chronically ill children in the United States (Hendricks, et al. 1995)

The effects of changing environmental conditions in increasing malnutrition are multifactorial. Poor environmental conditions may increase insect and protozoal infections and contribute to environmental deficiencies in micronutrients. Overpopulation, more commonly seen in developing countries, can reduce food production, leading to inadequate food intake or intake of foods of poor nutritional quality. (Blossen, 2005).

Chronic food deficits affect about 792 million people in the world including 20% of the population in developing countries. Worldwide, malnutrition affects one in three people and each of its major forms dwarfs most other diseases globally (WHO, 2000) Malnutrition affects all age groups, but it is especially common among the poor and those with inadequate access to health education and to clean water and good sanitation. More than 70% of children with protein-energy malnutrition live in Asia, 26% live in Africa, and 4% in Latin America and the Caribbean (WHO, 2000) The problems of poverty and under nutrition are wide spread and growing. Almost 40.000 children under the age of five years die each day from under nutrition and infection.

Malnutrition is a major health problem, especially in developing countries. Water supply, sanitation and hygiene, given their direct impact on infectious disease, especially diarrhea, are important for preventing malnutrition. Both malnutrition and inadequate water supply and sanitation are linked to poverty. Malnutrition in all its forms increases the risk of disease and early death. Protein-energy malnutrition, for example, plays a major role in half of all under-five deaths each year in developing countries (WHO, 2000). The majority (two third) of hungry people live in Asia. Currently, the largest increases in numbers of chronically hungry people occur each year in Africa, particularly in Chad, Sudan, Angola, Ethiopia, Mozambique, Somalia, Uganda, Zaire and Zambia. In Africa, over 200 million children in developing countries under the age of five are malnourished. Malnutrition contributes to more than half of the deaths nearly 12 million children less than five years of age in developing countries each year (WHO, 2003). A national survey conducted in 2014, the survey indicated towards a high prevalence of child malnutrition in Sudan: one-third (33 percent) of under-five children are underweight, nearly to in five (38.2 percent) children under-five years are stunted (too short for their age), and one in six (16.3 percent) children is wasted (too thin for their height). (MICS, 2014)

A national survey, conducted in 2000, provides data on prevalence of stunting, underweight and wasting among under-fives from 16 regions of northern Sudan (UNICEF, 2001). Another earlier survey provided data with less extensive regional coverage (WHO & FMOH, 1997). In 2000, the prevalence of malnutrition among children under five years was very high, reflecting the critical nutrition situation inherited from the past decades. Overall, 41% of children were underweight and 15% were severely underweight. There were regional variations in prevalence, with the highest prevalence observed in North Kordofan (50%). Children of mothers with no education were more likely to be underweight than those of mothers with higher education (CDC& WFP, 2004). Stunting (chronic malnutrition) affected 43% of under-fives and 24% were severely stunted. In general, children residing in rural areas and those born to mothers with low education were more likely to be affected by chronic malnutrition. There were significant regional variations in the prevalence of stunting, ranging from 31% in River Nile to 59% in Kassala Stunting prevalence was higher than 40% in the eastern states (Red Sea, Kassala, Al-Gadarif, Sinnar and BlueNile), and some central and western states (all Darfur and Kordofan states). Most of these states are not affected by conflict, but the eastern part of the country receives refugees from bordering countries, which disrupts livelihoods of the resident population. Overall, 16% of the children were wasted (acute malnutrition). Severe acute malnutrition affected 4% of the children. The prevalence of wasting varied by region, and levels were particularly high in North Darfur, where 23% of the children were wasted (UNICEF, 2001).

A survey was carried out in September 2004 in a crisis-affected population residing in an area covering all three states of Darfur, among 842 children 6-59 months. The prevalence of wasting among these children was 22%. The high child malnutrition rates in the Darfur were directly linked to the on-going crisis, loss of livelihoods and internal displacement (CDC& WFP, 2004).

The World Health Organization recommends exclusive breastfeeding until 6 months of age and continued breastfeeding for at least 2 years together with the introduction of adequate amounts of complementary foods of suitable nutritional and microbiological quality. In the population, infants exclusively breastfed up to 6 months are less affected by diarrhea and do not have growth deficits. exclusive breastfeeding for 6 months is the optimal way of feeding infants. Thereafter infants

should receive complementary foods with continued breastfeeding up to 2 years of age or beyond (WHO, UNICEF & WFP, 2007).

## 2. Materials and Methods

This study was done in Kassab and Fatbarno IDPs camps in Kutum locality- north Darfur State among children under 5 years and their mothers.

A sample size of (101) was determined based on an absolute precision of 5% and confidence interval of 95%. The previous studies conducted by GOAL, prevalence of malnutrition in Sudan, as well as global malnutrition have been used as reference, the average was estimate by 22%. Based on that the below formula has been used:

$$n_0 = \frac{z^2 p(1 - p)}{e^2}$$

When applying the above formula

$$n_0 = \frac{1.96^2 0.78 * 0.22}{0.08^2} = 103$$

$n_0$ : Initial sample size.

Z: A basic of the normal curve that cuts off an area  $\alpha$  at the tails.

P: Estimated proportion of an attribute that is present in the population.

e: Acceptable sampling error (is the width of the confidence interval).

Adjusted sample size, (Based on initial sample size above);

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}}$$

$$n = \frac{103}{1 + \frac{(103 - 1)}{5,138}} = 101$$

n: Adjusted sample size.

N: population size.

Cluster sample technique was used where divided study area into 4 sectors (A, B, C and D), then data were collected by Questionnaire and Anthropometric Measurements Technique, then data were analyzed by SPSS version (20) and organized it in tables, graphs and figures. Ethical approval was taken from North Darfur State Ministry of Health Ethics Committee. Verbal consent was taken from the concerned authorities and families.

### 3. Results

Table 1: MUAC measurement of children under five years

MUAC Ranges per cm	Numbers	Percentage
<11.5	9	8.9%
≥11.5 and <12.5	7	6.9%
>12.5	85	84.2%
Total	101	100%

\* Normal > or equal to 12.5cm; MAM for >11.5 and <12.5cm; SAM for <11.5 cm)

Table 2: Distribution of mothers according to education level

Education level	Frequency	%
Illiterate	50	49.5
Kindergarten/ Primary (Basic)	32	31.7
Secondary	15	14.9
University	4	4
Total	101	100

The above table; shows that, 49.5% of the mothers were illiterate, 37.7% had primary (basic school), while only 4% had university education.

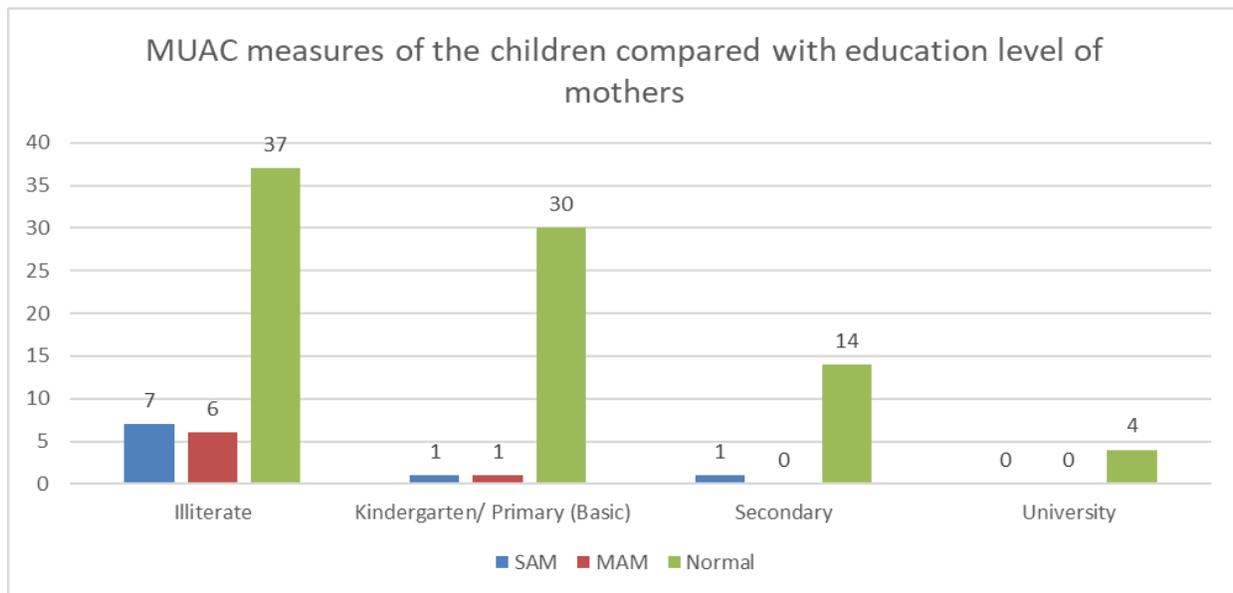


Figure 1: relationship between malnutritional status of children and educational level of their mothers.

(P value = 0.03) significant

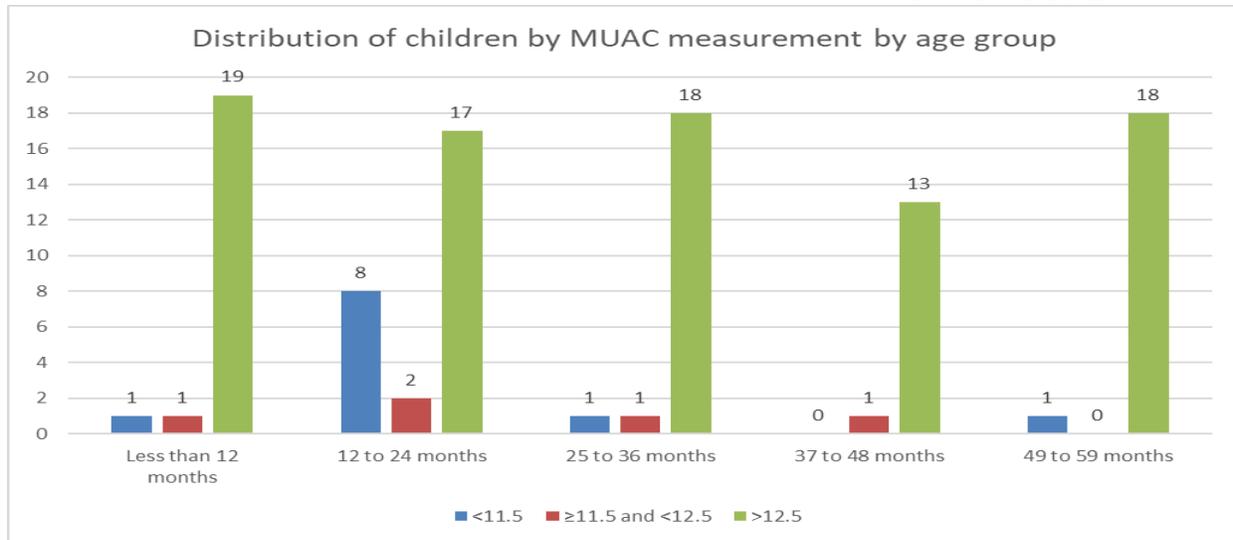


Figure 2: the above fig. show that most of malnourished children in group age 12- 24 months. (n=101).

Table 3: Exclusive breast feeding practices and complementary feeding practices for children under 2 years

Variables	Exclusive breast-feeding practices	complementary feeding practices	Percentage
yes	73	-	72.3
No	28	-	27.7
Before sex months	-	32	31.7
After sex months	-	69	68.3
Total	101	101	

The above table shows that (72.3%) of mothers are exclusive breast feeding for their children and (68.3%) they are practice complementary feeding for their children after six months of age.

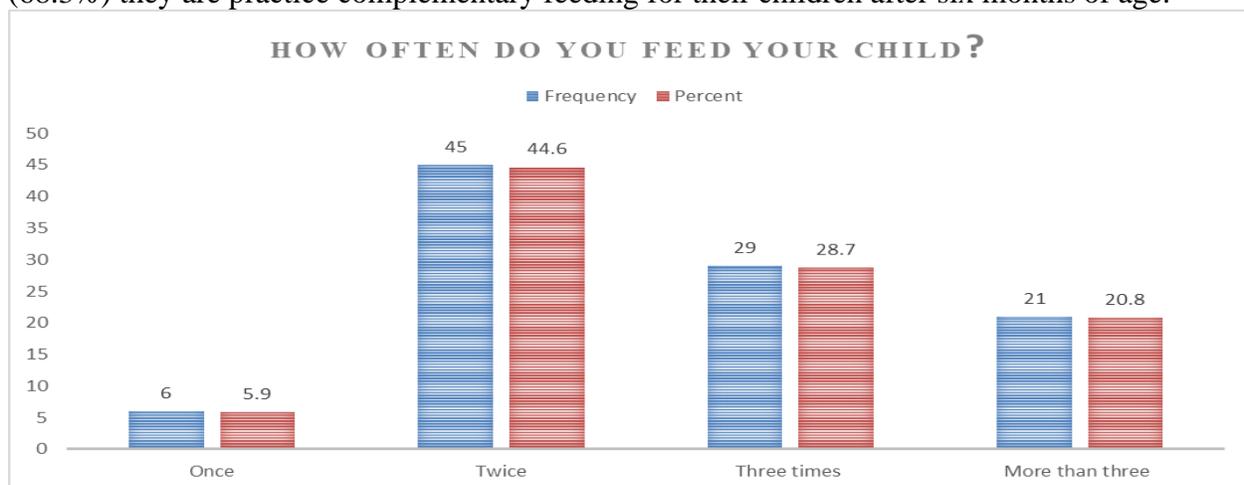


Figure 3: the above fig. show that (44.6%) of the mothers fed their children two times daily, (28.7%) were fed their children three times per a day and (20.8%) were fed their children more than 3 times per a day.

Table 4: Show relationship between Nutritional status and breastfeeding of children.

Breast feeding	Variable	Yes	No	No. of children	%
	SMA	7	2	9	8.9
	MAM	7	0	7	6.9
	Normal	81	4	85	84.2
	Total	95	6	101	100

(P value = 0.02) significant

The above table show that there is relationship between malnutritional status of children and breastfeeding of them. (P value = 0.02 < 0.05)

#### 4. Discussion

This study found that according to MUAC measurements, 84.2% of the children had their MUAC value >12.5 indicating that they were not malnourished, 8.9% had their MUAC value <11.5 indicating SAM and 6.9% had their MUAC value between  $\geq 11.5$  and <12.5 which are identified as MAM (table No: 1). Which is agreed with a survey conducted by GOAL organization in Kutum locality in 2011 shows that the rates of SAM among children under five years of age remain high at 13.3%, while the MAM rate is at 2.9%.

The study shows that there's relationship between age group of starting complimentary feeding and malnutrition status of the children (P; value = 0.02). 76% of the mothers with normal children were started complementary feeding after 6 months as per WHO recommendation and 24% of the mothers were started before completed the 6 months. While 69% of mothers with malnourished children were started complementary feeding before 6 months and only 31% of the mothers with malnourished children were started after completed 6 months. (Table No; 12).

Through this study, we observed that there's a relationship between the mothers who practice exclusive breast feeding for their children and nutrition status of children (P; value = 0.01). out of 85 normal children there's 80 children were received exclusive breast feeding and only 20% children did not receive exclusive breastfeeding. Out of 16 mothers with malnourished children about 70% mothers they didn't exclusive their children exclusive breastfeeding and only 30 mothers were practice exclusive breastfeeding for their children. (Figure No; 9). As per WHO, only 39 per cent of children less than six months of age in the developing world are exclusively breastfed and just 58 per cent of 20-23-monthold's benefit from the practice of continued breastfeeding.

The study showed that most of the children identified with malnourished either SAM or MAM were in the age group between 12 – 24 months representing by 63%, following by less than 12 months & 25 to 36 representing by 25% and lastly 37 – 48 month & 49 – 59 months representing by 12%. (figure No; 3).

#### 5. Conclusion

There is high prevalence rate of malnutrition among children under 5 years in Kassab and Fatbarno IDPs camps.

There's relationship between age of starting complimentary feeding, practice exclusive breast feeding and malnutrition status of the children under 2 years.

Most of the children identified with malnourished either SAM or MAM were in the age group between 12 – 24 months.

## 6. Recommendations

According to results of this study it is recommended that raising awareness of mothers about importance of breast feeding for infant to improve nutritional status of their children, encourage complementary feeding and begin it in right age according to WHO recommendations. support mothers by income generation projects to improve their economic status for improvement nutritional status of their children.

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