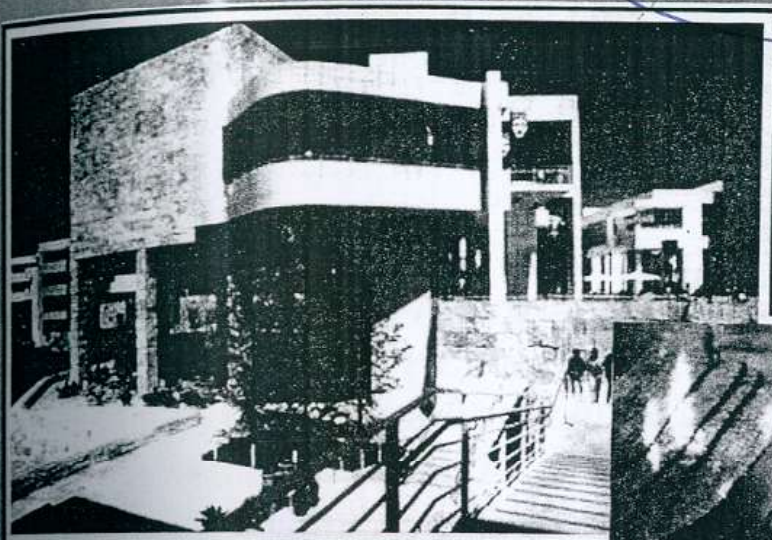


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## THE PREVALENCE OF PROTEIN ENERGY MALNUTRITION IN NIGERIA AND DIETARY MANAGEMENT (A REVIEWED STUDY)



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### Abstract

Protein energy malnutrition describes the spectrum of nutrition disorder, which occurs in children under five years when the diet is poor in protein and energy, faulty weaning practices, poverty, poor sanitary conditions, minimal medical attention and endemic childhood infections. Studies in Nigeria revealed that protein energy malnutrition is one of the major nutrition problems causing death in children under five years. This reviews highlight

- (a) prevalence, causes and mortality rate attributed to protein energy malnutrition,
- (b) breast feeding and weaning patterns(c) hematological parameter of PEM children
- (d) Dietary management of PEM children, towards rehabilitation

### Introduction

Protein energy malnutrition is one of the major nutritional problems affecting the vulnerable groups of infants and the young children in Nigeria. The origin of PEM can be primary when it is the result of inadequate food intake or secondary when it is the result of other diseases that lead to low food ingestion, inadequate nutrient absorption or utilization, increase nutritional requirements and /or increase nutritional losses.

Protein-energy malnutrition especially among young children remained one of the principal health problems in developing countries including Nigeria. It is estimated that in Nigeria, 40 percent of the infants who die under the age of five years were severely malnourished, Nweze (1995). This review highlights the prevalence of PEM and causes of death in malnourished Nigeria children and the appropriate dietary management.

### Mortality rate attributed to protein energy malnutrition (PEM)

Numerous studies, base on analysis of anthropometric data from children in various part of Nigeria, have shown a high prevalence of PEM among children

less than five years of age. The Nigeria demographic and health survey (NDHS 1990) revealed that 43.% under five children age are stunted, 35. 7% are under weight, 9.1% are suffering from wasting. A more recent study by UNICF (1993) in ten states of the federation reported the proportion of stunted children to be 37.6% and wasting to be 10.9%.

Kaine (1997) in his study of PEM incidences made across the countries reported 14% for Ibadan, 13% Enugu, 11.6% Illorin, 4.5% Benin,city, 8% Calabar. Newze (1995) study also reported over 40% infant mortality in Nigeria major cities are attributed to PEM. National Policy on Food and Nutrition in Nigeria (NPFII) (2001) attributed the cause of various forms of malnutrition to be a combination of inadequate food intake, lack of access to clean water, health and sanitation problems coupled with pooreconomic situation and deteriorating state of household security in Nigeria.

### The effect of parents income on PEM

Poverty often accompaies PEM due to low food availability ad lack of means to produce or buy food. Asokumar (1991) reported a increase

in the number of malnourished children among parents who earned less than ₦2000.00 (two thousand) naira per month. Parents of higher income have well nourished children.

### Breast feeding and weaning patterns

The breastfeeding pattern is reported to be similar in both mothers of malnourished and nourished children. Recent studies have shown that the duration of breast feeding has been reduced significantly in both rural and urban areas, with commercial milk

formular been introduced as early as one month for gainful employment to augment the family's income.

In Nigeria, the major weaning food are made from corn, millet or sorghum often in form of a thin gruel, Kazimi (1997), Osuhor (1990). The composition of these pap's is shown in table 1 other foods often given are rice, boiled yam, cassava meals like Eba and Fufu, which are given to older children. They are starchy foods of low nutritive value, Nweze, N. (1995).

**Table 1 ; Composition of Some Traditional Nigeria Weaning food stuffs.**

Food	Energy	Protein	Carbohydrate	Fat
Groundnut (roasted)	549	23.2	23.0	44.8
Millet	329	7.4	77.7	1.3
Guinea corn	347	11.1	74.1	3.2
Rice (parboiled)	364	7.0	79.8	0.6
Cowpeas	338	22.5	61.0	1.4
Beans (black eyed)	398	32.8	23.6	26.4
Egg (Hen)	140	11.8	0.6	9.6
Fish (dried)	309	63.0	Trace	6.3
Fish (mackerel)	166	19.0	Trace	10.0
Beef (lean)	237	18.2	0.0	8.0
Condensed milk	140	7.0	10.1	17.7

*Asokumar and Enahoro (1991)*

### The significance of education in feeding habits

Lack of education has been shown to be one of the contributing factors to the occurrence of PEM. Igogbeja (1991) reported that about 64 percent and 72 percent respectively of malnourished children's mother did not have formal education. The literacy status of the fathers of the well-nourished children was significantly higher than that of fathers of the malnourished children. Both studies showed a decreased in the incidences of PEM as the levels of education of the mothers increased. Female literacy correlates inversely with infant mortality rate which is very high in countries with low female literacy level. Nweze (1995).

### Hamatological parameters of the PEM children

The reduction in hemoglobin concentration and red cell mass (RBC) often accompanies severe PEM, Nweze (1995). Protein is essential for the proper production of hemoglobin and red blood cell mass, because of reduced cell mass and thus oxygen requirement in PEM, fewer RBC are required to oxygenate the tissues. Since blood volume remain the same, this reduced number of RBC can look like an iron deficiency anemia with low hemoglobin. The anemia of PEM may be complicated by deficiencies of iron and other nutrients and by associated infections, Parasitics infestation and malabsorption. A diet lacking in protein is usually deficient in iron, folic acid and

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less frequently vitamin B-12, Mobofung (1987). A greater proportion of economically available food in Nigeria is high in calories and low in iron content, Odeleye (1991). This in itself presents limitations in their use of evaluating iron status in anemia PEM children. Odeleye et al (1991) studied the effect of high calories supplement on the homological response of some anemia PEM children, result showed that packed cell volume (PCV) serum iron and serum ferritin increased significantly. A slight increase in the hemoglobin and a decrease in urinary iron excretion was also reported but were not statistically significant. Reasons for the increase in these indicators are unknown, Nweze (1995).

Mortality was highest amongst who received iron supplementation early in the study. An increase in serum iron, particularly during the first week of treatments have been shown to encourage the growth of iron-requiring pathogenic bacteria resulting in or aggravates bacteria infection and possibly increase the mortality of the PEM children, Nweze (1995).

#### **Dietary management for PEM child**

Research and epidemiological studies of affected children showed that more nutrient other than protein are required in the diet. Also, the dietary components need to be locally available and within the purchasing power of the affected families. There is a commonly held, though erroneous, belief that rehabilitation diets for PEM care providers in many Africa countries are

faced with unavailability of funds to purchase on a regular basis such as milk, eggs and protein concentrates, many nursing mothers are at a loss on how to feed their ever increasing number of malnourished children, Smith (1995).

#### **Appropriate local fluid mixture**

Due to characteristically poor appetite of the malnourished child, fluid mixtures are better accepted and tolerated. It is possible to formulate appropriate and nutritionally adequate food mixture using locally available food materials. Available data suggested that one of crucial factor which determines the nutritional effectiveness of such a mixture is its energy density. Thus edematous malnutrition (kwashiorkor and marasmic kwashiorkor) have to achieve an energy intake of 58.3k cal/kg/day before they do start to lose edema fluid. Those children who fail to consume 58.64kcal/kg/day (the energy level considered approximately the basal metabolic rate (BMR) of a malnourished child) accommodated edema. Thus the energy intake at which edema dissolved and below which edema accumulated was found to be 58.3-64.8kcal. kg/day. In addition the energy cost of tissue maintenance was estimated to be approximately 81.6 kcal/ kg / day, Smith et al (1992).

Table 11 and 111 gives the recipes for local fluid mixtures that can be used during the early periods of management of the malnourished child or until the child can adequately consume a solid diet.

Table ;11

Food Ingredient	Mixture(a) (g)	Mixture (b) (g)
Powdered full- cream milk	23	119
Vegetable oil	50	47
Pure cane sugar	50	40
Moderately thick corn pap	750	750

**Local fluid mixtures for protein energy Malnutrition**

Sources; smith el al (1992) kwashiorkor (b) marasmus

These mixture may not supply adequate amount of vitamins and so appropriate vitamin supplement should be used.

- (1) Mix all ingredients wells and make up to 1 liter with previously boiled and cooled water.
- (2) Some or all of the powdered milk in the mixture can be replace with egg to provide equivalent amounts of

protein with adjustment made in the quantities of other ingredients to ensure adequate caloric density of the final mixture.

- (3) Any local gruel commonly used for infant feeding can be used instead of corn pap as the case for the mixtures. Corn pap also provides a significant amount of needed potassium, smith el al (1992)

<b>Break fast options</b>	(a) Corn, sugar, black eyed beans, pepper onion, crayfish, palm oil, salt.
(a) corn pap with akara or moimoi	(b) Local rice (fermented), groundnut, sugar.
(b) kunu gyada	(c) Beans /cowpea groundnut, grayfish, soymilk, sugar.
© waike soya	Dough from fermented yam and cassava or fermented corn flour, meat or fish, crayfish, Egusi (melon Seed) fresh tomatoes, onion, leafy vegetable palm oil, salt.
<b>Lunch options</b>	
Amala Eko (madidi/Agidi) with vegetable or beans soup.	
<b>Dinner options</b>	
Bean or yam pottage	Yam or black – eyed beans, crayfish, pepper, onion, fresh tomatoes, tomato puree, palm oil and salt.
<b>Rice with stew</b>	Rice, meat, or fish, pepper, onion, fresh tomatoes, tomato puree, palm oil, salt.

Table 111

**Composition of a rehabilitation diet**

Source, Smith et la (1992)

**Conclusion**

Protein energy malnutrition is one of the major nutritional problems in Nigeria. Inadequate or low protein energy foods coupled with, faulty weaning practices, poverty, unhygienic feeding conditions, infection and unorthodox medication are some of the predisposes conditions,

Dietary management do not have to be only milk based alone to be effective, nursing mothers should be enlightened on local available and cheap dietary components equally rich in protein, energy, mineral and vitamins that can aid protein energy malnourished child rehabilitation back to health.

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