

## **Nutrition Levels, Food Consumption patterns and Health Status of Pre-school Children in Primary Schools in Owerri Municipal, Imo State, Nigeria**

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### **ABSTRACT**

*To assess the nutrition levels, health status as well as the food consumption pattern of pre-school children in some private and government schools in Owerri Municipal council, Imo State, Nigeria. Anthropometric measurements of 490 pre-school children aged 2 – 5 years were obtained and assessed by National Center of Health Statistics (NCHS) reference population and according to WHO (1983) guidelines. Information on health status as well as food consumption pattern was obtained by structured questionnaires. The mean z-score anthropometric indices were above 2SD, cut off for determining those at risk. The percentages of nature of malnutrition were almost similar to 2.5%; accepted value for prevalence of malnutrition in the countries of the world. Percentage of pre-school children consuming the different food groups at least once a week were highest in meat, milk followed by bread and cereals groups. Health status and sanitary facilities were adequate. Measurements of health status as well as food choice and consumption pattern give some initial indication of the probability of the household food insecurity and poverty alleviation factors in the community. Effort should be aimed particularly at ensuring diet quality of pre-school children in conjunction with healthy environment.*

### **INTRODUCTION**

Pre-school children nutrition levels have been a major concern in nutrition studies because of their vulnerability to ill health. Studies have indicated that malnutrition, a public health problem is most prevalent in pre-school children (Morale *et al* 1991; Mazumder *et al* 1996). More than 175 million of children that are under five worldwide are presently believed to be under nourished according to weight-for-age criterion (Encyclopedia of Food Science, Food Technology and Nutrition, 1993). The United Nations recently estimated that some 150 million children are under-weight, about 20 million low birth weight infants are born each year, and some 40 million children are afflicted with vitamins deficiency (UN/ACC/SCN, 1991). Early malnutrition, which stunts growth, has been repeatedly reported to contribute to poor intellectual and physical development of children (Simondon, 1998) and consequently stifles development.

Food consumption of children has been reported to be deficient of protein foods. Kumar (1979) found that the consumption of meat and eggs of pre-school children was low and milk consumption decreased as the child grew older. Nnanyelugo (1982) reported that children are mainly fed on starchy roots and tubers leading to chronic malnutrition with low body weight and height for their age. When a child consumes a wide variety of healthful foods in adequate amounts, the potential for health and proper growth is excellent. Pre-school children are particularly at risk of malnutrition and health. Poor health status suppresses growth, reduces voluntary food intake and increases nutrient needs while poor

nutritional status lowers immune competence and therefore increases susceptibility to infection (Latham, 1995). Malnourishment of children of under-five is inconsistent with building the long-term future generation of a country. This study determines the nutrition levels, food consumption pattern as well as the health status with the view of improving the nutritional status of pre-school children.

## MATERIALS AND METHOD

**Site and Sample Selection:** This study was carried out in two government (Alvan Ikoku College of Education and Imo State University Staff Nursery/Kindergarten schools) and two private (Goshen and Start-right Nursery and Kindergarten) schools all located in Owerri Municipal Council Imo State, Nigeria. The sample population involved male and female pre-school children aged 2 – 5 years. All the pre-school children in each school were selected for the study. A total sample size of 490 pre-school children was obtained.

**Data Collection and Processing:** Anthropometric measurements, namely, weight and height of the 490 pre-school children were taken by direct measurement following standard procedures established by WHO (1976). Weight and height data were converted into anthropometric indices (nutritional indices) using international reference population (de Onis and Habicht, 1996) that expresses values in form of Z-Scores. Standard deviation (S.D. Score; Z-score) of nutritional index for an individual was calculated by age class, according to age classification of WHO (1976), sex and overall sample with the following formula, and percentages of the nutritional levels of pre-school children obtained. Pre-school children with incomplete data for any anthropometric indices were not included.

$$\begin{array}{l} \text{S. D. Score} \quad - \quad \frac{\text{Actual child's measure} - \text{median reference population}}{\text{Standard deviation value of reference population}} \\ \text{Or} \\ \text{Z-score} \end{array}$$

The child's age was obtained from school records. Data on food consumption pattern, health status and socio-economic factors were collected through the use of structured questionnaires distributed to the mothers of pre-school children. Information on the food consumption patterns of the pre-school children was determined through a food frequency list method. At household level, the parents of each child in the schools were asked to recall the number of times daily and weekly as well as the number of servings each food item was consumed by each pre-school child.

The food item consumed and the percentage of pre-school children consuming each food item was calculated. The pre-school children were grouped according to the sub-groups of each of the factors examined and percentages of pre-school children in various sub-groups of the factors were calculated.

**Statistical Analysis:** Student T-test was carried out to determine the levels of significance of the difference in mean weight for age, height for age and weight for height indices between sexes and age groups.

## RESULTS AND DISCUSSION

**Anthropometric Indices:** The anthropometric Z-score of the pre-school children differ significantly ( $P < 0.05$ ) between the age groups (Table 1). The Z-scores were lower in age group 48 - <60 month for weight for age, height for age and weight for height indices than in 24 - <48 months (Table 1). Between the ages of 48 - <60 months pre-school children have been introduced completely too family food. Adequate consideration of food choice of the pre-school children could be lacking. In most cases, the amount and quality of food consumed by the pre-school at this stage could be inadequate (Nnanyelugo, 1982).

Similarly, the Z-scores of the pre-school children were higher in males than in females for only weight for age and weight for height indices but differ significantly only in weight for height index ( $P < 0.05$ ). This observation did not agree with the findings of UNICEF/WHO (1985) who reported that from birth up to 6 years of age, girls have slightly more body fat than boys. However, the potential higher muscle mass in males than in females could have contributed to the higher weight for age and weight for height indices found in males. The higher but significant height for age index in females has been observed by Ahn and Shariff (1995) who reported that the rate of growth in height of females increases at a greater rate than in males after the control in standard height over a period of 46 months. Table 1 shows that the anthropometric Z-scores of the pre-school children were above - 2SD reference populations, the convectional cut-off point for Africa (WHO 1983). The observation concurs with the report of Tylleskar and Tylleskar (1988).

**Prevalence of Nutrition Level of Pre-school Children:** Figure 1 shows that the percentage of pre-school children under nourished, and stunted were higher in age group 48 - < 60 months, but lower for wasting than in the age group 24 - < 48 months. This suggests that adverse health effects accumulate with age during the first few years of childhood (Pelletier 1995, UN/HCC/SCN (1993). Older children are exposed to relatively poorer environment than younger children. In addition, studies of the rate of increase in length have revealed that stunting process starts in first year of life up to second year of life but becomes more prominent at the latter age (WHO, 1987). The observation that wasting was higher in age group 24 - < 48 months than 48 - < 60 months could be attributed to dietary deficiencies and diarrhea disease during weaning practices.

The percentages of pre-school children under-nourished, stunted and wasted were higher in females than in males. In most households, the head of the household and male children are given more preference during food sharing, because males are seen to succeed their fathers after death (Martorell *et al* 1984). Such practices could endanger the nutritional status of other members of the household especially in households where the economic situation is

poor. However, the percentages of under nutrition and wasting among the pre-school children were similar to the acceptable level of malnutrition (2.5%) in the countries of the world (WHO, 1983) while the percentage of stunting among the pre-school children was lower than the acceptable value. More so, the prevalence of malnutrition, was lower than that reported in Nigeria report (UN/ACC/SCN, 1993).

**Table 1: Mean anthropometric Z-scores of pre-school children by age class and Gender**

Age class (mth)	Weight for age			Height for age			Weight for Height		
	n	Z-score	SD	n	Z-score	SD	n	Z-score	SD
24 - < 48	132	0.57	1.04	132	0.54	1.16	265	0.32	0.89
48 - < 60	237	0.09	1.10	233	0.19	1.04	118	0.17	1.02
<b>Gender</b>									
Male	184	0.21	1.01	183	0.18	0.99	201	0.24	0.82
Female	185	0.12	1.11	182	0.49	1.19	202	0.08	0.98
Overall	369	0.17	1.06	365	0.33	1.12	403	0.15	0.90

**Note:** Pre-school children with incomplete anthropometric indices were not included

- a) P < 0.05; t-ratio -2.285 for age class, P < 0.05, t-ratio -1.37 for gender
- b) P < 0.05; t-ratio - 3.08 for age class, P < 0.05, t-ratio = 4.60 for gender
- c) P < 0.05; t-ratio = 4.20 for age class, P < 0.05, t-ratio - 4.98 for gender

**Food Choice and Consumption:** Table 2 shows that the highest percentage of the pre-school children consumed more of meat than other food group. Milk, fruits and vegetables, and bread and cereals followed this. The least consumed food item was fats and oils. Similar consumption pattern has been reported in Ghana (Armar-Klimesn, 1995) where fish was eaten by more pre-school children at a lower per capita consumption, while the proportion of children eating dried and fresh vegetables were higher and more consistent all year round. The number of serving per day was above the recommended daily servings (Krause and Mahan, 1984) except for fruits and vegetables, and butter, fats and oils. Another possible explanation could be that the food groups were substituted to a certain extent with energy dense foods.

**Health Status:** The percentages of pre-school children who did not suffer from diarrhea, fever and cough were higher than those who suffered from the diseases (Table 3). The number of times the pre-school children suffered from the diseases in every two weeks were less than twice. More so, the percentage of pre-school children immunized was much higher than those that were not immunized. The low distribution and frequency of diseases observed in the pre-school children could be attributed to high level of immunization practice. Immunization is a means of preventing communicable diseases in children (UNICEF/WHO, 1985) and thus a safeguard for better nutrition and health.

**Table 2: Percentage of pre-school children consuming the different food groups at least once a week**

<u>Food groups</u>	<u>n</u>	<u>%</u>	<u>Mean daily no. of servings</u>
Milk	198	40.41	2.11
*Meat & Fish	207	42.24	2.31
Fruit & Vegetable	207	42.24	1.97
Bread and Cereal	215	43.88	4.20
Butter, fat, oil	124	25.31	1.78

n = 490

\* Meat = Meat and Fish group.

**Table 3: Percentage and mean values of pre-school children by health factors**

<u>Morbidity and Mortality factor</u>	<u>n</u>	<u>%</u>	<u>Mean no. of times per two weeks</u>
<b>*Diarrhea</b>			
Yes	99	20.20	1.2
No	391	79.79	
<b>*Fever</b>			
Yes	165	33.67	1.3
No	325	66.32	
<b>*Cough</b>			
Yes	196	40.00	1.1
No	294	60.00	
<b>Immunization</b>			
Yes	365	74.48	
No	125	25.51	
<b>Number of children</b>			
<b>From 2 – 5 years</b>			
Alive	383	78.16	
Dead	107	21.83	
<b>Sanitary facility</b>			
<b>Indoor Kitchen</b>			
Yes	386	78.77	
No	104	21.22	
<b>Indoor toilets</b>			
Yes	381	77.75	
No	109	22.24	
<b>Source of water</b>			
Tap	385	78.57	
Borehole	93	18.97	
Stream	12	2.44	

\*Number of pre-school children suffering from diarrhea fever and cough in the previous two weeks

Furthermore, Table 3 shows that the percentage of pre-school children alive was higher than those dead. The observation could be as a result of good health-care practices among the households of the pre-school children. The percentages of pre-school children in households that have indoor kitchens, indoor toilets and access to tap water were higher than the others that had none. Gopaldas *et al* (1983) reported that poor sanitary conditions, specifically source of water supply and toilet, adversely affect nutrition and health of children below four years of age. Similarly, Horwitz (1987) has reported a rapid decline in infant mortality due to decrease of potable water supply and sewage in urban areas. Water supply as well as basic sanitary facilities in the households of the children could have helped reduced childhood morbidity and mortality, thus enhancing the health status of the pre-school children.

The study shows that the nutrition and health status as well as food consumption pattern of pre-school children in some private and government schools in Owerri Municipal is encouraging. However, efforts to maintain nutrition and health status should be focused through improved programmes for food security aimed particularly at ensuring diet quality in conjunction with promoting appropriate healthy environment.

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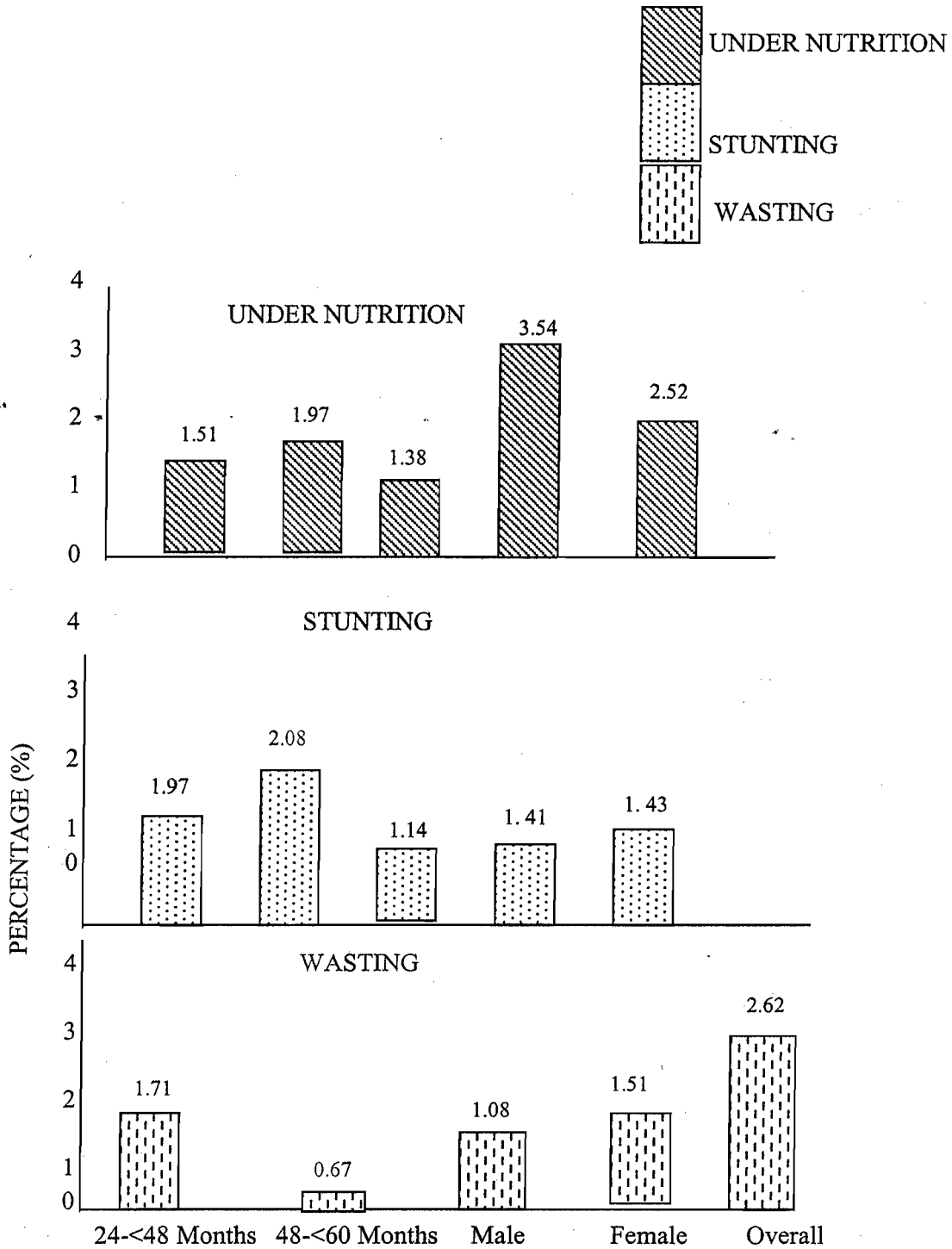


FIG. 1: Percentage of under nutrition, stunting and wasting among pre school children