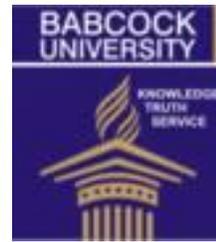




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## Nutritional status, dietary practices and cognitive development of pre-school children in Ikenne Local Government Area, Ogun State

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### Abstract

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Childhood is a stage of life when all the body systems are rapidly growing and the organs are developed to perform all the biological functions. Therefore the right to food and adequate nutrition is a fundamental right of every child and crucial towards the eradication of hunger among children. This study was carried out to assess the nutritional status and dietary practices of pre-school age children and the effect on their cognitive development in Ikenne. A structured questionnaire consisting of four parts were administered among the respondents to elicit information on their dietary practices and nutritional status. A purposive sampling technique was used in selecting a total of 150 school age pupil Data collected were subjected to descriptive statistics of (SPSS) version 17. The Pearson Correlation range test was used to explain the relationships that existed among the variables. The result of the analysis revealed that majority (55%) respondent eat three times a day while the minority (22%) respondents eat more than four times a day. The anthropometric assessment indicated that a higher number (76%) respondent had normal weight for their Age followed by minority (20%) respondent had moderate weight for their Age. The result also showed that there was a positive and significant ( $p < 0.05$ ) correlation (0.332\*) between the type of meal and cognitive development. This implied that nutritive meals contribute to the cognitive development of a child and that an adequate nutritious food is necessary for the intellectual development of a growing child.

**Keywords:** Nutritional status, dietary practices, cognitive development, anthropometric assessment.

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### Introduction

Nutrition plays an important role in the health and development of a growing child (Mananga, *et al.*, 2014). Good nutrition during the first two years of life is very important for the optimal, physical and intellectual development. School age children are particularly vulnerable to growth retardation, micronutrient deficiencies and common childhood illnesses such as diarrhea and the acute respiratory infections (UNICEF, 2011). Adequate nutrition protects young school age children, strengthens the immune system and reduces the risk of non-communicable diseases related to foods during the lifecycle. School aged children constitute an important population of any society as they represent the future generation (Ene-Obong and Ekweagwu 2012). Therefore good nutrition and adequate nutrition of school age children improve their growth

rate, learning potentials, contributes to the healthy adulthood and ageing, also consequently contribute to the national economic growth and development of a nation. It has been reported that there is substantial reduction in child death rates as more than 90% of the world's children are now surviving beyond the age of five years. Therefore there are children attending school more than ever before (UNICEF, 2012). Despite the improvement in survival of school aged children, there is still the problem of diseases and ill health among this vulnerable group, especially, in areas where poor nutrition and infection persist. The burden of ill health which is as a result of micronutrient deficiencies, common infections, poor vision and hearing disability, adversely compromises the children's development, school attendance and ability to take advantage of the opportunity to obtain

formal education (FRESH, 2012). The positive effect of nutrition intervention on cognitive development has been documented (Mananga et al., 2014, UNICEF, 2012). Therefore several supplementation studies have suggested that the potential for greater cognitive development through improved nutrition at early ages is crucial, especially the first three years of life that constitute the most vulnerable period in which nutritional status is of particular importance. UNICEF and other NGOs reported evidences of long lasting benefits from early supplementation nutrients on cognition when children reach school age (Koichiro et al., 2005). It is necessary to screen and assess the dietary practices and nutritional status of school age children in order to target the group with poor nutritional status, so they can benefit from health and nutrition intervention program. This study therefore was aimed at assessing the nutritional status and dietary practices of the school age children in relation to their cognitive development.

## Materials and methods

### The Study Area

The study was conducted in two nursery schools consisting of a private (Victory Nursery School in Ikenne) and a public (Isanbi Model Nursery School) in Ilishan, Ogun State. These nursery schools were chosen for the study based on their higher enrollment figures of pre-school children in Ikenne Local Government Area.

### Sampling size determination

The study was also a purpose research design in that the study was primarily focused on the school aged children group of the population. The formula below was used to determine the sample size.

$$n = \frac{N}{1 + N(e)^2}$$

Where n = sample size required

l = a constant

N = Total number of < 20 adolescent in both secondary schools = 132 total adolescents

e = is the desired level of precision required for the result (p < 0.05) = 5%. (Ngozi et al., 2014).

A total population number of (150) school aged children between the ages of 2 to 5 years old were mobilized and participated in the study. The study involved sampling their perception and intellectual responses on the dietary habits and nutritional status lifestyle of these school aged children where (n = 75) for each pupil.

### Data collection

A structured questionnaire that consisted of four sections on Socio-demographic characteristics of the children's parent that were interviewed separately, dietary practices, nutritional status, the class teacher's continuous assessment record of each child and the cognitive development assessment of each respondent was carried out using the check list of TAAP, (2006) procedure.

### Anthropometric measurements

The Anthropometric method was a procedure used to assess the nutritional status of the children in relation to their body growth measurement of the height, body weight and body size.

### Weight measurement

The body weight of each child was determined using a portable Bathroom scale calibrated in kilograms. This scale was placed on level surface and being always set at zero reading before every measurement. Measurement were read and recorded to an accuracy of 0.1 (kg) as described by Lohman, et al., (1988).

### Height measurement

Height of each child was measured using a vertical calibrated stadiometer board placed against the vertical wall with a metric tape rule calibrated to the nearest (0.1cm). Measurement was taken with each child barefooted, standing erect with the parallel and heels put together as described by (WHO, 2007) standard references. The tape rule was used to measure the head circumference of each child and the measurement was recorded to the nearest 0.1 cm, while a mid-upper arm circumference tape was used to measure the mid upper left arm region of each child and was recorded to the nearest 0.1 cm as well.

### Class performance

Class performance assessment of each child was carried out by the class teacher using a continuous assessment program based on: attendance record, quiz performance, assignment grading scores, mid-term examination and final examination score of each child.

### Cognitive assessment

The cognitive development was evaluated based on the recognition and identification of objects/articles and the level of response to some questions by each child using a check list standard of TAAP, (2006) procedure.

### Statistical analysis

Data collected was subjected to descriptive statistics of (SPSS) version 17, (2004). The information was classified under the means, frequency and percent. Pearson correlation range test (1976) was used to explain the relationships that existed between the dietary practices and food frequency pattern as they relate to the variables on cognitive development of the children.

### Results

The demographic characteristics of parents of the nursery and primary school children are presented in **Table 1**. The Table classified the parent information under variables, frequency and percentage. Majority (61.3%) parents of children in Victory nursery and primary school in Ikenne were within the age bracket of (31-40) years, while minority (38.7%) parents fall within the age bracket (20-30) year. In Isanbi Model Majority (60%) and (57.3%) school children from private and public schools respectively preferred to eat three times per day, while (21.3%) and (24.0%) of nursery schools preferred to eat more than four times a day. The study showed that majority (52.0%) and (44.0%) children from the private and public nursery schools respectively preferred grain food source for their breakfast cereals while minority (6.7%) and (5.3%) preferred legumes source of food for their breakfast. This is evidence that children do not like beans/legumes as part of their food menu. Majority (64.0%) and (44.1%) school children in private and public nursery schools preferred snack food like hot puff-puff followed by (18.7%) and (25.3%) children that preferred snack like sausages. School children from private nursery school (36.0%) and (14.7%) preferred to eat protein snack food that consisted of fish pie and meat pie respectively. The study indicated that school children do not like vegetables as there was no data to indicate their preference. However, majority (40.0%) and (57.4%) children from private and public nursery schools preferred to eat watermelon fruits regularly in their meals, followed by (46.7%) and (13.3%) children that preferred to eat pineapple fruits. The study also showed that (17.3%) children from private nursery school preferred to eat apple daily.

nursery and primary school majority (64%) parents were within the age (31-40) years, while (36%) parent of the school children were within (20-30) years age bracket. The highest number (52%) and (54.7%) of mothers having their children attending Victory nursery and Isanbi Model nursery schools respectively were civil servants by profession while lower numbers (48%) and (45.3%) mothers were self-employed. Also majority (89.3%) and (92%) parents of school children attending Victory and Isanbi Nursery schools were married while minority ((10.7%) and (8%) were single parents. Also highest number (60%) and (66.7%) fathers having children in Victory and Isanbi Model Nursery and primary schools were highly educated with t least a University degree, however the lower number (8%) and (16%) parents were having secondary school diploma while (14.75%) and (4%) parents had no formal education.

Figure 1, shows the nutritional status of the pre-school Age children that participated in the study. The nutritional status was determined by calculating the: Weight for Age, Height for Age and Weight for Height indices. The prevalence of underweight shows (76.7%) pre-school children had normal Weight for their Age, followed by (20.0%) children that were slightly underweight while (3.4%) was moderately underweight for their Age. There was no data for severe weight loss among these children. The study also indicated the prevalence of stunting among the pre-school age children based on their Height for Age. The study shows that majority (56.6%) children respondent had Normal Height for their Age, followed by (16.5%) children population had moderate Height for their Age while a lower number of (6%) children were severely stunted for their Age. The prevalence of wasting status calculated based on Weight for Height shows that majority (80.6%) respondent had Normal Weight for their Height with (15.4%) children maintained a mild Weight for Height, while a minority (2.7%) number of children had moderate Weight for the Height. Also lower number (1.4%) children were severely stunted and underweight for Weight for Height ratio.

**Table 1.** Socio-demographic characteristics of parents of the respondents

ITEMS	VARIABLES	IKENNE		ILISHAN	
		Frequency	Percent (%)	Frequency	Percent (%)
Age Bracket	(20-30)	29	38.7	27	36
	(31-40)	46	61.3	48	64
Child's Age	2	6	8	30	4.0
	3	13	17.3	10	13.3
	4	45	60.0	5	66.7
	5	11	14.7	12	16
Child's Sex	Male	37	49.3	30	40
	Female	38	50.7	45	60
Religion	Christianity	64	85.6	68	90.7
	Islam	11	14.4	7	9.3
Occupation of Mother	Civil Servant	39	52	41	54.7
	Self Employed	36	48	34	45.3
Occupation of Father	Civil Servant	38	50.7	41	54.7
	Self Employed	37	49.3	34	45.3
Marital status	Single Mother	8	10.7	6	8
	Married	67	89.3	69	92.0
Educational Status of Mother	Primary	13	17.3	10	13.3
	Secondary	8	10.7	11	14.7
	Tertiary	48	64	51	68
	No Formal Education	6	8	3	4
Educational Status of Father	Primary	13	17.3	10	13.3
	Secondary	6	8	12	16
	Tertiary	45	60	50	66.7
	No Formal Education	11	14.7	3	4

The dietary practices of the school children in both private and public nursery schools are presented in **Table 2**. The Table classified the information under variables, frequency and percentages. Majority (74.7%) and (80.0%) school children in the private and public nursery schools respectively preferred to eat at home, while lower number (17.4%) children of private nursery school preferred to buy food from the fast food restaurants, when compared to lower number (5.3%) children in public nursery school that preferred to buy food at fast food restaurants. However, (14.7%) of public nursery school children preferred to buy food from street food vendors.

The milestone test result on recognition and intellectual potential of the children showed a positive association between cognitive development of a child and the habit of eating breakfast and the regular eating of fruits and vegetables. There are positive and highly significant ( $p < 0.05$ ) correlation coefficient ((0.485\*\*), (0.901\*\*), between the habit of eating breakfast and eating of fruits and vegetable respectively. These positive correlations suggested that breakfast, eating of fruits and vegetables can have positive beneficial effects on the cognitive and learning potential of a child.

**Table 2: Dietary practices and food frequency of nursery school children.**

Items	Variables	Ikenne		Ilishan	
		Frequency	Percentage (%)	Frequency	Percentage (%)
Source of food	Home made food	56	74.7	60	80
	Fast food	13	17.4	5	5.3
	Street food	6	8	10	14.7
Meals intake per day	Twice	14	18.7	3	4
	Three times	45	60	43	57.3
	Four times	0	0	11	14.7
	More than four times	16	21.3	18	24
Breakfast	Cereal	31	41.3	38	50.7
	Legumes	5	6.7	4	5.3
	Grains	39	52	33	44
Lunch	Cereal	41	54.7	3	4
	Legumes	26	34.7	6	8
	Tubers	2	2.7	36	48
	Others	6	8	30	40
Supper	Cereal	9	12	10	13.3
	Legumes	10	13.3	8	10.7
	Tubers	9	12	15	20
	Grains	41	54.7	42	56
	Others	6	8	0	0
Snacks	Meat pie	11	14.7	10	13.3
	Gala	2	2.7	3	4
	Sausage	14	18.7	19	25.3
	Fish pie	27	36	10	13.3
	Pof-pof	48	64	33	44.1
Fruits	Apple	13	17.3	3	4
	Orange	22	29.3	19	25.3
	Pineapple	35	46.7	10	13.3
	Water melon	40	53.3	43	57.4

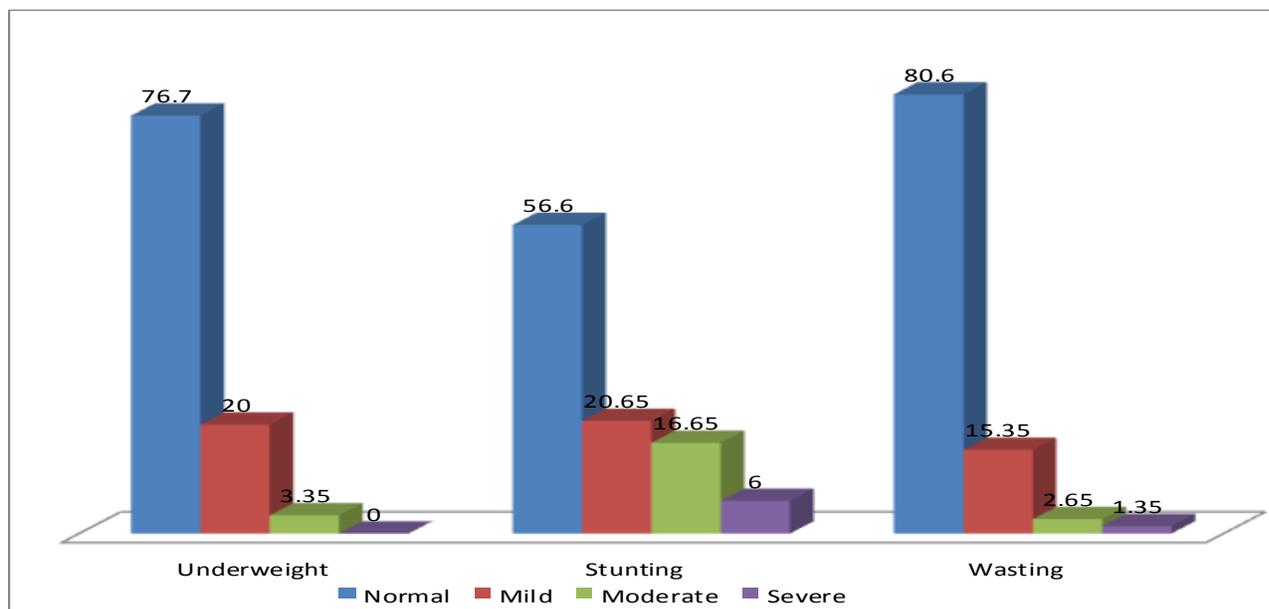


Figure 1: Nutritional status of pre-school children

**Table 3:** Correlation coefficients between dietary practices and cognitive development of the pre-school children

	Performance in class	in Milestones for cognitive development
Meals/day	-0.003	-0.113
Meal type	0.144	0.201
Breakfast	-0.036	0.485**
Lunch	0.500**	-0.170
Dinner	0.470**	0.173
Snacks	-0.539**	0.107
Fruits	-0.030	0.901**
Performance in class	1	0.640**
Milestones for cognitive measu	.640**	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

### Discussions

Finding from this study revealed that the children's parents were highly educated which is a possible contributor to the fact that most of the school age children had access to healthy nutritional status, especially when age and sex were used to assess the nutritional status of children respondents. Consistent with the reports of others: (UNICEF, 2012; WHO, 1985; FAO, 1993; Mananga, et al., 2014), sound nutrition is important for the good health of the growing children in order to ensure the optimal, physical, psychological and cognitive development.

Good health and adequate nutrition of school age children improve growth and development of the children, improve learning potentials, enable healthy adulthood and ageing, contribute to decreasing risk of non-communicable diseases related to nutritional deficiency in children (Ene-Obong and Ekweagwu, (2012).

This study demonstrated that majority of children eat breakfast, lunch and dinner regularly at home with their parents. This is contrary to several reports that adolescent groups eat differently than the children (Hajraet al., 2009; Cooke and Wardie. 2005; Dwyer,

1995) where skipping of meals is a rare occurrence among the school age children. Nutritional status of the school age children demonstrated that prevalence of normal weight, normal height for age and normal weight for height suggested that both male and female school age children were eating well in line with WHO standard.

### Conclusions

The study has provided sufficient evidence to show that nutritional needs remain throughout the life cycle. Good nutrition generally can improve the spirit and quality of life of children. It can also speed recovery from illness and prolong life. The investigators strongly feel that all educational institutions including primary schools should routinely organize talks, workshop of different aspects of foods and nutritional education that will increase the awareness of the children on nutritional needs for maintaining good health.

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