

## BODY MASS INDEX AND FOOD CONSUMPTION PATTERN OF PUBLIC AND PRIVATE SCHOOL CHILDREN IN ILISHAN-REMO, OGUN STATE, NIGERIA

Ani Ime F., Adeoye Bolade K., Ajuzie Nnenna C.; Ngozi E. O. Oyekan J.

Department of Nutrition and Dietetics  
Ben Carson Senior School of Medicine and Surgery  
Babcock University, Ilishan- Remo, Ogun State, Nigeria  
**Corresponding author:** Ani, Ime Franklin,  
**Email:** anii@babcock.edu.ng

### ABSTRACT

*A total of 240 school children aged 7-12 years were used for this study. 120 were from public school and 120 were from private school. Structured questionnaire was administered to obtain information on children's demographic data, family characteristics and consumption pattern. The height and weight of the children were measured using approved methods. BMI was calculated and WHO reference for height-for-age and BMI-for age were used to classify the children. Differential statistics were used to analyze the data. . Frequent consumption of cereal group was higher than other food group in both public school (70%) and (50%) private school. It was found that 8.3% of children in the public school do not consume milk at all and low consumption of fruits and vegetables are common among school children. Effects of family characteristics on BMI were also determined through linear regression analysis. Result obtained showed that stunting was prevalent in both schools as 45.8% had normal height in the public school and 50% had normal height in the private school. Overweight was more prevalent in the private school (50%) than in the public school (16%). However there was a high prevalence of underweight and thinness among the children from public (20.8% and 16.6%) school compared to private (16.7% and 8.3%). Combine contribution of family type, family size and parents occupation had a significant effect on the body mass index (BMI) of the children from both private and public schools ( $p < 0.05$ ). There is need for nutrition intervention in Ilishan -Remo*

**Keywords:** Body Mass Index, Dietary pattern, private and public schools

### INTRODUCTION

Child malnutrition is a major public health problem that is widespread globally. Good nutrition is an essential determinant for well-being and its associated consequences, thus making malnutrition an important public health problem [16]. Good nutrition is a fundamental human right. [1] Eating pattern and adequate nutrition are an important component of a child's overall health. They impact on many aspects of health and are determinants of future physical and mental well-being. They also determine growth, alter an infant's susceptibility to disease and provide opportunity for interaction between the child and their parent or family [2,3]. Eating is one of life's greatest pleasures and it is a pleasure which for most people is available several times daily. The inability to provide this pleasure for the family

evokes a feeling of guilt and anger in people particularly women. The nutrition of a nation is an important factor that influences the development and growth of such nation. It has been reported that countries particularly the developing countries that invest in improved nutrition for their women and children get a high returns on their spending by having a society that is productive [4]. Illiteracy, ignorance, poor communication, transportation and distribution of food are major factors that affect malnutrition as quite a number of women have no knowledge of the nutrient value of foods. Some eat nutritious food occasionally and not as a matter of necessity. Ignorance means that even when nutrient-dense foods are accessible, they may not be eaten. All these contribute to malnutrition and determine the state of health of mother and child [5]. Added to the above is the fact that some countries grow enough food but lack appropriate storage facilities leading to food shortages at particular periods of the year. Starvation in such countries or others could however be occasioned to natural disasters such as floods, droughts and hurricanes. Under such conditions, nutrition for the mother and child is compromised [6]. Investing in childhood nutrition will have both short and long term benefits of huge economic and social significance, reduced health care costs throughout the life cycle, increased school attainment and intellectual capacity, increased productivity and boost wages and make children more likely to escape poverty at adulthood [19]. Malnutrition limits people's ability to fulfill their potential. Improved nutritional status will lead to an improved ability to secure rewarding and sustainable livelihoods. The elimination of child malnutrition in would increase its national income, expenditure for nutrition, health and education [7]. The purpose of this study was to compare the nutritional status of school children from private and public schools in Ilishan-Remo, Ogun State

## METHODOLOGY

The study was conducted in the public and private primary schools in Ilishan-Remo in Ikenne Local Government area. There are five public schools and eighteen private schools in the town. The sample population consisted of primary school children, aged 7-12years. A total of 240 school children were selected through random sampling from three private schools. A questionnaire was structured and administered to elicit information on the children's demographic data, their family characteristics and consumption pattern. Height was determined using a heightometre. The children's shoes/sandals were removed, feet flat and together in the centre and measurement read and recorded to the nearest 0.1cm. Weight of the children were taken with minimal clothing on a bathroom scale. The scale was placed on a leveled surface and was always placed at zero reading before every measurement. Measurements were read and recorded to an accuracy of 0.5kg. Data was analyzed using the Statistical

Software Package for Social Sciences (SPSS). Descriptive analysis, frequencies and percentages were used to analyze the data. In addition, possible effect of family background on body mass index (BMI) was determined through linear regression analysis.

## RESULTS AND DISCUSSION

TABLE 1: The demographic data and family characteristics of public and private school children

	PUBLIC SCHOOLS		PRIVATE SCHOOLS	
	Frequency (no)	Percentage %	Frequency (no)	percentage%
<b>Sex</b>				
Male	70	58.33	65	48.33
Female	50	41.66	55	45.83
<b>Age</b>				
7-9	45	37.5	50	41.66
10-12	75	62.5	70	58.33
<b>TYPE OF FAMILY</b>				
Monogamous	70	58.3	65	54.16
Polygamous	30	25	25	20.83
Single parenting	20	16.7	30	25
<b>Total</b>	120		120	
<b>Family Size</b>				
1-6	54	45	72	60
7 & above	66	55	48	40
<b>Total</b>	120		120	
<b>Father's Occupation</b>				
Requires formal education.	14	11.7	41	34
Does not require formal education.	106	88.3	79	65.8
<b>Mother's Occupation</b>				
Requires formal education.	5	4.2	61	50.8
Does not require formal education.	115	95.8	59	49.2

**TABLE 2: Prevalence of stunting**

PUBLIC SCHOOL					
SEX	NORMAL	SEVERE	MODERATE	MILD	TOTAL
Male	30	10	10	15	65
Female	25	15	10	5	55
Total	55	25	20	20	120
%	45.8	20.8	16.7	16.7	100
PRIVATE SCHOOL					
Male	43	5	10	7	65
Female	17	5	20	13	55
Total	55	10	30	15	120
%	50	8.3	25	16.7	100

**TABLE 3: BMI of public and private school children**

PUBLIC SCHOOL				
SEX	NORMAL	OVERWEIGHT	UNDERWEIGHT	TOTAL
Male	35	10	16	76
Female	20	10	9	45
Total	55	20	25	120
%	45.8	16.6	20.8	100
PRIVATE SCHOOL				
Male	15	20	10	50
Female	15	40	10	70
Total	30	60	20	120
%	25	50	16.7	100

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**Table 4: Food consumption pattern of public & private school children**

PUBLIC						
	<b>FOOD GROUP</b>	<b>FREQUENTLY (%)</b>	<b>OCCASIONALLY (%)</b>	<b>SELDOM (%)</b>	<b>NONE (%)</b>	<b>TOTAL (%)</b>
		10 (8.3)	70 (58.3)	30 (25)	10 (8.3)	120(100)
	MILK GROUP	20 (16.7)	60 (50)	35 (29.2)	5 (4.2)	120(100)
	GROUP	70(58.3)	20(16.7)	30(25)	- (0)	120(100)
	MEAT GROUP	10(8.3)	80(66.7)	30(30)	- (0)	120(100)
	GROUP	30(25)	48(40)	42(35)	- (0)	120(100)
<b>PRIVATE</b>	CEREAL GROUP	30(25)	70(58.3)	20(16.7)	- (0)	120(100)
	FRUIT &VEG.	25(20.8)	65(54.2)	30(25)	-(0)	120(100)
	LEGUMES	50(41.7)	20(16.7)	50(41.7)	- (0)	120(100)
	MILK GROUP	10(8.3)	90(75)	20(16.7)	- (0)	120(100)
	MEAT GROUP	20(16.7)	43(35.8)	57(47.5)	- (0)	120(100)
	CEREAL GROUP					
	FRUIT &VEG.					
	LEGUMES					

**TABLE 5: Contribution of the independent variables to the BMI of public school children**

MODE I	R	R SQUARE	ADJUSTED R SQUARE	STD,ERROR OF THE ESTIMATE	CHANGE STATISTICS		
					R SQUARE CHANGE	F CHANGE	DFL
1	.963	.927	.924	.31136	.927	289.672	5

**Table 6: Contribution of each variable to BMI of public school children**

MODEL	UNSTANDARDIZED COEFFICIENTS		STANDARDIZED COEFFICIENTS	T	SIG.
	B	STD. ERROR	BETA		
(Constant)	-.510	.147		-3.478	.001
Family type	1.124	.087	.759	12.854	.000
Family size	-.184	.113	-.105	-1.630	.106
Fathers occupation	.397	.083	.459	4.769	.000
Mothers occupation	-.707	.140	-.544	-5.054	.000
Consumption pattern	.178	.038	.446	4.675	.000

**TABLE 7: Contribution of the independent variable to the BMI of private school children**

MODE I	R	R SQUARE	ADJUSTED R SQUARE	STD. ERROR OF THE ESTIMATE	CHANGE STATISTICS		
					R SQUARE CHANGE	F CHANGE	DFL
I	.971	.943	.941	.29976	.943	377.381	5

**TABLE 8: Contribution of each variable to BMI of private school children**

MODEL	UNSTANDARDIZED COEFFICIENTS		STANDARDIZED COEFFICIENTS	T	SIG.
	B	STD. ERROR	BETA		
(Constant)	-.615	.130		-4.729	.000
Family type	.971	.064	.667	15.210	.000
Family size	.218	.115	.133	1.900	.060
Fathers occupation	.086	.076	.093	1.128	.262
Mothers occupation	.162	.108	.124	1.502	.136
Consumption pattern	.004	.032	.008	.110	.912

Table 1 shows the demographic data and family characteristics of both public and private school children. 58.33% males and 41.66% females from public school and 48.33% males and 45.83% females from private school took part in the study. The age range of children from both type of schools were 37.5% and 62.5% for public and 41.66% and 58.33% for private for 7-9 age range and 10-12 age range respectively. The percentage of children from monogamous home was higher, 58.3% for public school and 54.16% for private school. Children from polygamous home were more in the public school (25%) than in the private school (20.83). However single parenting was higher in the private school (25%) than in the public school (16.7%). Children from large family size (7 and above) were more in the public school (55%) than in the private school (40%). Considering the occupation of the parents, many of them were into jobs with no formal education. For public school, 88.3% of the fathers from private school were into jobs with no formal education. For the mothers on the other hand, 95.8% and 49.2% from public and private schools respectively were into jobs with no formal education. The percentage of parents who were into jobs with no formal education was higher in the public school than in the private school.

Table 2 shows the prevalence of stunting. In the public school 45.8% were normal, 16.7% were mildly stunted, and 16.7% were moderately stunted while 20.8% were severely stunted. However, in the private school 50% were normal, 16.7% were mildly stunted, and 25% were moderately stunted while 8.3% were severely stunted. More children were severely stunted in the public school (20.8%) compared to private school (8.3%). There was prevalence of stunting in both private and public schools considering the high percentages of stunting recorded in both type of schools. Prevalent rate of stunting in the private school was 50% and 54.2% in the public school. The observation of this study is in collaboration with the report of stunting among school children attending conventional primary school in Kaduna State, Nigeria [8]. This finding is also in collaboration with the report of 54.11% stunting among rural school children [9]. Earlier report that malnutrition is still a problem in Nigeria is being reiterated in this finding [10].

Table 3 shows the BMI-by-Age of the sample population. The BMI of the public school children compared with the BMI of the private school show that more children in the public school (45.8%) had normal BMI while only 25% of children from private school had normal BMI as many were overweight and thinness in both schools as the percentages were high. Thinness and underweight were more prevalent in the public school (16.6% and 20.8%) than in the private school (8.3% and 16.7%). This result support the earlier report that prevalence of malnutrition in non-fee paying school was higher than in fee paying school [11]. The nutritional status of

public school is poor and significantly different from that of private school [12]. The result of this finding also corroborate the report that undernutrition characterized by stunting, wasting and underweight affects a substantial proportion of the children in Nigeria [13, 14].

Table 4 present food consumption patterns of private and public school children in the sample population. Frequent consumption of milk and milk products, meat and meat products, legumes and fruit and vegetable was low but larger percentage take them occasionally both in public and private school. A substantial number of children from both schools seldom consume foods in these food groups. Frequent consumption of cereal group was higher than other food group in both public school (70%) and (50%) private school. It was found that 8.3% of children in the public school do not consume milk at all. The occasional and seldom consumption of foods in the milk, meat and fruit and vegetable group could be as a result of the socio economic status of the parents. These are achievable through adequate means such as finance, time, skills and social or cultural positions. Less than 2.0 % of children consumed chicken, egg and meat and <5% consumed fruits [14]. Findings from this study shows that low consumption of fruits and vegetables are common among school children [15, 16]

Table 5 shows the combine contribution of family type, family size, and parents' occupation to BMI of public school children. The F value of 289.69 was higher than the table value (1.95) at  $p < 0.05$  meaning that, the contributions of these variables to nutritional status was highly significant. The percentage contributions of these variables were 92.4% which indicated that these variables were strong predictions of the nutritional status of the children. 7.6% could not be accounted for as this represent effect due to other variables that were not part of the study.

Table 6 presents individual contribution of these variables to BMI. Type of family ( $t=12.854$ ) contributed mostly and positively to the BMI of the children. This is followed by father's occupation. However, family size and mother's occupation had negative impact on the BMI of the school children. High percentage of mothers (95.8%) of the children from this type of school, were into jobs requiring no formal education. There is a positive correlation between malnutrition and mothers educational level [8]. High percentage of children from this school, were from family size of seven and above. The negative impact of family size reported in this finding corroborates the report of that the smaller the family size the better the nutritional status [17].



Table 7 show the combine contribution of family type, family size, and parent occupation to BMI of private school children. The F value (377.382) was higher than the table value (1.95) at  $p < 0.05$  suggesting significant contribution of the variables to nutritional status. The percentage contribution of these variables was 94.1% signifying strong prediction of nutritional status of the children by these variables. 5.9% could not be accounted for and this represent contribution by other variables not considered in this study.

Table 8 presents individual contributions of these variables to the BMI of private school children. Type of family ( $t=15.210$ ) had highest contribution to the BMI and this is followed by family size, mother's occupation and father's occupation positively affected the BMI of the children. Difference in the BMI of private school children and public school children could be as a result of difference in the effect of these factors on their BMI. This agreed with the earlier report that children in the private school usually have better nutritional status [11].

## CONCLUSION

As a result of prevalence of stunting, underweight and overweight among children in both private and public school, it is strongly recommended that education workshop on adequate nutrition and related topics should periodically be organized for parents and expectant mothers in Ilishan-Remo.

## REFERENCES

1. Jonsson, U. (1996). Nutrition and the Convention on the Rights of the Child. *Food policy*, 21, 41-55.
2. Ahmed, Z., Kyi, D., & Isa, A. (1996). Breastfeeding and Weaning Practices in Rural Communities of Kelantan. *Mal. J. Nutr.*, 2, 148-154.
3. Al-Sarheed, M. (2006). Feeding Habits of Children with Down's Syndrome Living in Riyadh, Saudi Arabia. *J. Trop. Pediatrics*, 52, 83-86.
4. Fagbule, D., & Olaosebikan, A. (1992). Weaning Practices in Ilorin Community, Nigeria. *West African Journal of Medicine*, 11(2), 92-99.
5. Ighogboja, S. (1992). Some Factors Contributing to Protein Energy Malnutrition in the Middle Belt of Nigeria. *East African Medical Journal*, 69(10), 566-571.

6. Okwori, E. (2015). Food Consumption Pattern, Anthropometric Indices and Micronutrient Status of Children Aged 6-59 Months in Kaduna State, Nigeria.
7. F. A. O. (2000). Agriculture: Towards 2015/30 Technical Interim Report Rome: FAO. Retrieved from
8. Hassan, A., Onabanjo.O.O and Oguntona C.R.B (2012). Nutritional Assesement of School-Age-Children Attending Conventional Primary and Integrated Qur'anie Schools in Kaduna. *Journal of Medical Sciences* 6(4):184-192
9. Vandana Sati and Saroj Dihiya (2012). Nutritional Assessment of Rural School- Going Children (7-9) Years of Hisar District , Haryana 1:363. Doi 10.4172/Scientific reports.363
10. Anugwa Uchenna, Ikwueze Chukwukezie, Magnus Felix, Monye Henrietta. Prevalence of Malnutrition in Children Who Presented in the Outpatient Clinic and Institute of Child Health of University of Nigeria Teaching Hospital Ituku-ozalla in June 2009, *Journal of the university of NIGERIAMEDICAL STUDENTS*.
11. Olanipekun, T. O, Obatolu, V.A., Fasoyiro, S. B, Ogunba, B. O. (2012). Assessment of Nutritional Status of Primary School Children in Ibadan, South West Nigeria. *Nutrition and Food Science*, Vol. 42 iss:6pp 390-396
12. Adegun, J.,Ajayi, v. and Alebiosu E.,(2013). Differences in the Nutritional Status of Young Children from Public and Private Owned School in Ekiti State Nigeria. *European Scientific Journal*Vol. 9 no.1
13. Adelekan, D. (2010) Prevalence of Malnutrition and Vitamin A Deficiency in Nigeria Preschool Children. Substituting on High Intake of Carotenes.
14. Ene-obong, and Ekweagwu E. ( 2012) . Dietary Habits and Nutritional Status of Rural School Age Children in Ebonyi State, Nigeria. *Nigerian Journal of Nutritional Sciences* 33(1) 23-30

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15. Marjan Manoucheri N., Sakineh J., Maryam F., Kamal H., Ziba F., Maryam F., Parvaneh K. and Rizieh O. (2014). Nutritional Knowledge, Practice and Dietary Habits among School Children and Adolescents. *International Journal of Preventive Medicine* Vol 5 ( suppl 2)
16. Bamidele Bello, Oyenike Ezekiel and Olusegun Temitope Afolabi (2016). Dietary pattern and nutritional status of Primary School pupils in a South Western Nigerian State: A rural urban comparison. *African journal of food science* Vol. 10 (10) pp 203-212
17. Mierzejewska, (1995), Age at Menarche as an Indicator of the Socio Economic Situation of Rural Girls in Poland in 1969, 1977 and 1987. *American Journal of Human Biology*. 7:651-656.
18. Ajieroh, V. (2010). A Quantitative Analysis of Determinants of Child and Maternal Malnutrition in Nigeria. IFPRI Nigeria Strategy Support Program Brief No. 11.
19. Nutrition Society of Nigeria 45<sup>th</sup> General Meeting and Scientific Conference (2015). Facts on Drivers of Malnutrition in Nigeria: a Call for Action by Civil Society Scaling-up Nutrition in Nigeria.