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The Prevalence of Malnutrition among Children Aged 6-10 Years in Umuahia South, Abia State, Nigeria



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Abstract

The challenges of hunger and inadequate intake of food which hampers the nutritional status of children remains an issue of concern in Nigeria. This study assessed the prevalence of malnutrition among children aged 6-10 years in Umuahia South, Abia State. A multistage sampling technique was used to select the respondents for the study. Two hundred and twenty three (223) children 6-10 years were randomly selected from three community schools in Umuahia South. Structured and validated questionnaires were used in data collection. Data collection included basic characteristics of children, socio-demographic and socio-economic characteristics of the parents. Food habits of the participants, anthropometric characteristics of the children. Data obtained from the study were analyzed using Statistical Package for Service Solution (SPSS) for Windows Version 20. Descriptive statistics, frequency, percentages, Pearson's correlation, cross tabulation and chi-square were used to examine the relationship between the variables, significance was accepted at $p < 0.05$. Almost all the children (99.6%) were immunized. About half of the households (57.8%) had a size of 4-6 persons. More than one third of the mothers' had secondary (46.2%) and tertiary (30.9%) education. Most of the households used tap (70.4%) and borehole water (16.1%) as their major source of water. The households used gas (37.7%) and firewood (22.4%) mainly as cooking fuel. Based on the anthropometric status of the children, about 29.6% of the children were stunted, 5.8% were underweight and 2.6% were thin. There was a significant difference ($p < 0.05$) between the mother's education, source of water supply, mother's occupation and underweight in the children. In addition, there was a significant relationship ($p < 0.05$) between mothers' occupation, source of energy, type of toilet, good health facility and stunting in the children. There was a significant relationship ($p < 0.05$) between mother's education, source of water supply, source of energy, good health facility, type of housing and BMI-for-age in the children. Socio economic characteristics of the mothers was an important factor in the health and nutritional status of children. There is need for school feeding programs and nutrition education to improve on children's health and feeding habit.

Keywords: Prevalence; Malnutrition; Children 6-10 years; Umuahia south; Abia state; Nigeria.

1. Introduction

Malnutrition is a nutritional disorder which occurs in people and can destroy one's health. It is caused by a lack or surplus or imbalance of nutrients in the body. Malnutrition affects people's physical, mental growth, body immune system, health, and wellbeing. It also increases the risk of noninfectious and transmissible diseases, reducing productivity and other negative social and economic consequences on individuals, households, societies, and nations [1]. Most of the time inadequate dietary intake and infectious diseases are the cause for malnutrition [2]. Malnutrition remains a public health concern and has been rising in the world since 2015 [3]. Malnutrition manifests

as wasting (acute malnutrition), stunting (chronic malnutrition), underweight, over nutrition, mineral and vitamin deficiencies [4]. In 2022, the global prevalence of stunting and wasting in children was 22.3% and 6.8%, respectively [5]. Malnutrition is of particular relevance in sub-Saharan Africa, where two out of five children are stunted, and 6.9% wasted [5].

Expected weight gain and growth in childhood and adolescence are largely dependent on appropriate quality and quantity of foods, and are highly impacted by environmental and socioeconomic factors, such as maternal level of education, household income, sanitary conditions, and access to and use of healthcare services [6]. Political, economic, poor feeding and care practices, infection exacerbated by food insecurity, social and cultural settings restricting access to essential resources and human rights and poverty are the basic causes of malnutrition and may persist across generations, giving rise to a vicious cycle [7].

The interaction between undernutrition and infection can create a potentially lethal cycle of worsening illness and deteriorating nutritional status. Poor nutrition in the first 1,000 days of a child's life can lead to stunted growth which is associated with impaired cognitive ability and reduced school and work performance [5]. Persistent malnutrition throughout school age enhances somatic growth deficit, delays sexual maturity, and hinders development of cognitive and emotional skills acquired in this phase of life [8]. Inadequate diet and disease, in turn, are closely linked to the general standard of living, the environmental conditions, and whether a population is able to meet its basic needs such as food, housing and health care [1].

Nigeria has the second highest burden of stunted children in the world, with a national prevalence of 32 percent. An estimated 2 million children in Nigeria suffer from severe acute malnutrition [9]. The high rates of malnutrition pose significant public health and development challenges for the country [9]. Malnutrition worsens the health status and developmental potential of a child and makes every strategy for health, education and prosperity an uphill struggle. Therefore the study researched on the prevalence of malnutrition among children aged 6 to 10 years in Umuahia South, Abia State.

2. Materials and Methods

Two hundred and ninety (223) children aged 6-10years residing in Umuahia South, Abia State were selected using multistage sampling technique. In the first stage, three communities; Ubalaka, Ahiaukwu and Amakama were randomly selected from Umuahia South. In the second stage, three community schools were randomly selected from the three selected communities (Ubalaka, Ahiaukwu and Amakama) in Umuahia South. Using systematic random sampling, the class register was used to select two hundred and twenty three children aged 6-10 years in the schools selected.

A structured validated questionnaire was used to collect information on socio-economic, anthropometry and feeding habit of the children. The weight of the children were taken using the bathroom scale. The children were measured putting on light clothing, bare-footed and standing on the scale with their head pointing straight. Weight were measured to the nearest 0.1 kilogram (kg).

A stadiometer was used to measure height, the children were asked to remove their shoes. The requirement for the position of the stadiometer was on a flat, hard surface, next to a smooth and straight wall. The reading taken to the nearest centimeter. Shirker strip was used to measure the mid upper arm circumference of the children in centimeters.

The data from the questionnaires were captured onto an Excel spreadsheet and analyzed using Statistical Package for Service Solution (SPSS) for Windows Version 20.0 software programs. Anthropometric status of the children was analyzed using the WHO AnthroPlus. Socio economic characteristics and feeding habits were analyzed using frequencies and percentages, while Chi-square was used to analyze the relationship between feeding habit, socioeconomic status and anthropometric status of the children. Significance was accepted at P-value < 0.05.

3. Results

Table 1 shows the personal characteristics of the children. About 54.3% of the children were male, while 45.7 % were females. About 16.1% of the children were 6 years, 26.9% were 7 years, 18.8% were 8 years, 24.7% were 9 years, while 13.5% were 10 years. A quarter (44.4%) of the children had 3-4 siblings, 32.7% had 1-2 sibling, while 22.9% had more than 5 siblings. Based on the birth order of participating children, a quarter (48%) were in the middle, while 32.7% and 22.9% were first and last born respectively. Majority (99.6%) of the children were immunized, while very few (0.4%) were not immunized.

Table-1. Basic characteristics of children

Variable	Frequency	Percentage
Sex		
Male	121	54.3
Female	102	45.7
Total	223	100
Age		
6years	36	16.1
7years	60	26.9
8years	42	18.8
9years	55	24.7
10years	30	13.5

Total	223	100
Number of siblings		
1-2	73	32.7
3-4	99	44.4
<5	51	22.9
Total	223	100
Birth order of child		
First	82	36.8
Middle	107	48.0
Last	34	15.2
Total	223	100
Immunized		
Yes	222	99.6
No	1	0.4
Total	223	100

Table 2 shows the socio-demographic characteristics of the parents. More than half of the mothers (67.7%) were between the age range of 31-40 years, 17.0% were between 21-30 years, while 15.2% were between 41-50 years. Majority of the mothers (65.9%) were married, 17.9% were single, 2.2% were separated, 11.2% were widowed, while 2.7% were divorced. Majority (94.2%) of the respondents were Christians, 2.2% were Muslims, while 3.6% were Traditionalist. Based on household size, 57.8% of the children had a household size of 4-6persons, 21.5% had a household size of 1-3persons, 18.8% had a household size of 7-9persons, while 1.8% had a household size of 10 persons and above. About 46.2% of the mother had secondary education, 30.9% had tertiary education, 22.9% had primary education, while 4.9% had no formal education. A greater percentage (47.5%) of the mothers were civil servant, 22% were farmers, 13.5% were self-employed, while 12.1% were traders. About 57% of the mothers earned between N31,000-N60,000 a month, 24.2% earned between N61,000-N90,000, 16.1% earned less than N30,000, while 2.7% earned between N91,000-N120,000 per month. More than half of the households (62.3%) used pit latrine, 36.3% used water system, while 1.3% used bush. About 70.4% of the households used tap water as their major source of water, 16.1% used boreholes, while 13.5% used well water. About 37.7% of the households used gas as source of cooking fuel, while 22.4% used firewood. A vast majority (96%) of the respondent had good health care facility, while 4% did not have good health care facility. About 45.3% of the respondents lived in a self-contained apartment, 29.6% lived in a Bungalow, 24.7 % lived in a flat, while a few (0.4%) lived in a duplex.

Table-2. Socio-demographic characteristics of the mothers. N =223.

Variable	Frequency	Percentage
Age (years)		
>30	38	17.0
31-40	151	67.7
41-50	34	15.2
51-60	0	0
Marital Status		
Married	147	65.9
Single	40	17.9
Separated	5	2.2
Widowed	25	11.2
Divorced	6	2.7
Household Size		
1-3Persons	48	21.5
4-6persons	129	57.8
7-9Persons	42	18.8
>10 Persons	4	1.8
Religion	210	94.2
Christianity	8	3.6
Traditional	5	2.2
Islam	210	94.2
Educational Status		
No Formal Education	11	4.9
Primary Education	51	22.9
Secondary Education	103	46.2
Tertiary Education	69	30.9

Table-2. cont.: Socio-demographic characteristics of the mothers. N=223

Variable	Frequency	Percentage
Occupation		
Self employed	30	13.5
Farmer	49	22
Trader	27	12.1
Teacher	11	4.9
Civil servant	106	47.5
Estimated income		
Less than N 30,000	36	16.1
N 31,000- N 60,000	127	57
N 61,000- N 90,000	54	24.2
N 91,000- N 120,000	6	2.7
Type of toilet facility		
Pit latrine	139	62.3
Bush	3	1.3
Water system	81	36.3
Source of drinking water		
Tap	157	70.4
Well	30	13.5
Borehole	36	16.1
Source of energy		
Kerosene	10	4.5
Gas	84	37.7
Firewood	50	22.4
Electric cooker	2	0.9
Kerosene and gas	55	24.7
Gas and firewood	22	9.9
Type of house		
Self-container	101	45.3
Bungalow	66	29.6
Flat	55	24.7
Duplex	1	0.4
Good health facility		
Yes	214	96.0
No	9	4.0

Table-3. Food habits of the children. N=223

Variables	Frequency	Percentage
Frequency of consumption of breakfast		
Everyday	194	87.0
Sometimes	29	13.0
Meal skipped		
Breakfast	83	37.2
Lunch	128	57.4
Dinner	12	5.4
Child feeding pattern		
On same plate with older children	110	49.3
Alone on the child's plate	92	41.3
On same plate with all family members	7	3.1
With parents alone	2	0.9
With mother alone	7	3.1
With father alone	5	2.2
Snacks consumption		
Yes	217	97.3
No	6	2.7
Snacks taken		
Meat pie	6	2.7
Biscuit	12	5.4
Buns	5	2.2
Cake	1	0.4
Egg roll	8	3.6
Bread	5	2.2

Cheese balls	5	2.2
Popcorn	12	5.4
All of the above	163	73.1
None	6	2.7

Table 3 shows the feeding habits of the children. Majority (87%) of the respondent said they consumed breakfast every day, while 13% said they did not consume breakfast every day. from the study, the meal commonly skipped by the children was lunch (57.4%), few of the respondents (5.4%) skipped dinner. About 49.3% of the children ate with older children in the household, 41.3% ate alone, while few (2.2%) ate with their father. Majority of the respondents (97.3%) consumed snacks, while 2.7% did not take snacks.

Table-4. Anthropometric characteristics of children

Variables	Frequency	Percentage
Underweight		
Underweight	13	5.8
Normal	208	93.3
Overweight	2	0.9
Total	223	100
Stunting		
Stunted	66	29.6
Normal	149	66.8
Tall	8	3.6
Total	223	100
BMI-for-Age		
Thinness	6	2.6
Normal	207	92.8
Overweight	10	4.4
Total	223	100
MUAC		
Malnourished	1	0.4
Not malnourished	222	99.6
Total	223	100

Table 4. Shows the anthropometric status of the children. About 5.8% of the respondents were underweight, more than half (93.3%) of the children were normal, while 0.9% were overweight. About 29.6% of the children were stunted, 3.6% were severely tall, while 67% were normal. This result further reveals that 2.6% of the children were thin, 4.4% were overweight, while 92.8% were normal. Based on the mid upper arm circumference, 0.4% were malnourished, while 99.6% were normal.

Table-5. Relationship between mothers' socio-economic status and underweight

Variable	Underweight		Normal		Overweight		Total		p-value
	No	%	No	%	No	%	No	%	
Mothers education									
Primary education	6	2.6	46	20.6	0	0	51	22.8	0.044
Secondary education	4	1.7	98	43.9	0	0	103	46.1	
Tertiary education	3	1.3	64	28.6	2	0.9	69	30.9	
Total	13	5.8	208	93.3	2	0.9	223	100	
Mothers occupation									
Self employed	4	1.8	29	13.0	0	0	30	13.4	0.000
Farmer	3	1.3	46	20.6	0	0	49	21.9	
Trader	1	0.4	26	11.6	0	0	27	12.1	
Teacher	2	0.9	8	3.6	1	0.45	11	4.9	
Civil servant	3	1.3	99	44.3	1	0.45	106	47.5	
Total	13	5.8	208	93.3	2	0.9	223	100	
Source of water									
Tap	7	3.1	148	66.3	2	0.9	157	70.4	0.057
Well	3	1.3	27	12.1	0	0	30	13.4	
Borehole	3	1.3		14.7	0	0	36	16.1	
Total	13	5.8		93.3	2	0.9	223	100	

Table 5 shows the relationship between mothers' socioeconomic characteristics and underweight of the respondents. The chi-square analysis shows that there was a significant difference between the mother's education and underweight ($P=0.044$). Source of water supply had a positive significance with underweight ($P=0.057$). Mother's occupation also had a positive relationship with underweight ($P=0.000$).

Table-6. Relationship between mothers' socio-economic status and stunting

Variable	Stunted		Normal		Tall		Total		p-value
	No	%	No	%	No	%	No	%	
Mothers occupation									
Self employed	7	3.1	21	9.4	2	0.9	30	13.4	0.002
Farmer	13	5.8	36	16.1	0	0	49	21.9	
Trader	10	4.4	16	7.1	1	0.45	27	12.1	
Teacher	2	0.9	7	3.1	2	0.9	11	4.9	
Civil servant	34	15.2	69	30.9	3	1.3	106	47.5	
Total	66	29.6	149	66.8	8	3.6	223	100	
Toilet type									
Pit latrine	22	9.9	53	23.7	6	2.7	81	36.3	0.031
Bush	0	0	3	1.3	0	0	3	1.3	
Water system	44	19.7	93	41.7	2	0.9	139	62.3	
Total	66	29.6	149	66.8	8	3.6	223	100	
Source of energy									
Kerosene	5	2.2	5	2.2	0	0	10	4.5	0.024
Gas	25	11.2	59	26.4	0	0	84	37.6	
Firewood	18	8.0	27	12.1	5	2.2	50	22.4	
Electric cooker	0	0	2	0.9	0	0	2	0.9	
Kerosene and gas	7	3.1	15	6.7	0	0	55	24.6	
Gas and firewood	11	4.9	41	18.3	3	1.3	22	9.9	
Total	66	29.6	149	66.8	8	3.6	223	100	
Good health facility									
Yes	65	29.1	141	63.2	8	3.5	214	96	0.020
No	1	0.45	8	3.5	0	0	9	4.0	
Total	66	29.6	149	66.8	8	3.6	223	100	

Table 6 shows the relationship between mother's socioeconomic characteristics and stunting of the respondents. The chi-square analysis shows that there was a significant association between mothers occupation and stunting ($P=0.002$). Type of toilet facility had a significant association ($P=0.031$) with stunting. Source of energy and stunting had a significant association ($P=0.024$). Good health facility had a positive significance with stunting ($P=0.020$).

Table-7. Relationship between mothers' socio-economic status and BMI-for-Age

Variable	Thinness		Normal		Overweight		Total		p-value
	No	%	No	%	No	%	No	%	
Mothers education									
Primary education	3	1.3	47	21.0	1	0.45	51	22.9	0.046
Secondary education	2	0.9	96	43.0	5	2.2	103	46.1	
Tertiary education	1	0.45	64	27.0	4	1.8	69	31.0	
Total	6	2.6	207	92.8	10	4.4	223	100	
Source of water									
Tap	2	0.9	146	65.4	9	4.0	157	70.4	0.000
Well	1	0.45	35	15.7	1	0.45	30	13.4	
Borehole	3	1.3	33	14.8	0	0	36	16.1	
Total	6	2.6	207	92.8	10	4.4	223	100	
Source of energy									
Kerosene	0	0	9	4.0	1	0.45	10	4.4	0.040
Gas	0	0	40	18.0	4	1.8	44	19.8	
Firewood	2	0.9	45	20.1	3	1.3	50	22.4	
Electric cooker	0	0	2	0.9	0	0	2	0.9	
Kerosene and gas	4	1.8	50	22.4	1	0.45	55	24.7	
Gas and firewood	0	0	61	27.3	1	0.45	62	27.8	
Total	6	2.6	207	92.8	10	4.4	223	100	
Good health facility									
Yes	6	2.6	198	88.8	10	4.4	214	96.0	0.024
No	0	0	9	4.0	0	0	9	4.0	
Total	6	2.6	207	92.8	10	4.4	223	100	
Type of house									
Self-container	4	1.8	95	42.7	2	0.9	101	45.2	0.003
Bungalow	1	0.45	58	26.0	7	3.1	66	29.6	
Flat	1	0.45	53	23.8	1	0.45	55	24.7	
Duplex	0	0	1	0.45	0	0	1	0.45	
Total	6	2.6	207	92.8	10	4.4	223	100	

Table 7 shows the relationship between mothers' socioeconomic characteristics and BMI-for-age of the respondents. The chi-square analysis shows a significant relationship between mothers education ($P = 0.046$) and BMI-for-age, source of water supply had a positive significance with BMI-for-age ($P = 0.000$). Source of energy had a positive significance with BMI-for-age ($P = 0.040$). Good health facility had a positive significance with BMI-for-age ($P = 0.024$). There was a significant relationship between type of housing and BMI-for-age ($P = 0.003$).

4. Discussion

More than half of the children studied were males. Higher population of males obtained in this study is consistent with the report of [Varella \[10\]](#) that there is a higher gender ratio of male children in Nigeria. A quarter of the children had 3-4 siblings; this is in line with [Rahman \[11\]](#). Almost all the children were immunized; this is because of the education and awareness created by the government and the health sectors on the benefits of immunization. More than half of the mothers were within the age range of 31-40 years and were married.

Majority of the respondents were Christians and this is so because the study was conducted in the South-Eastern part of Nigeria which is dominated by Christians. According to the history of Christianity in Nigeria, Christians are dominant in the Southern region. Based on household size about half of the households had a size of 4-6 persons; this is in agreement with [Mortazavi, et al. \[12\]](#).

More than one third of the mothers' had secondary and tertiary education; this is slightly in disagreement with the report of [\[13\]](#) where it was observed that in Nigeria women between the ages of 20-65 years who had tertiary education as their highest level of education were 7.9%. A greater number of the mothers were civil servants or had something doing in terms of business; this finding is in line with [Oguizu and Alozie \[14\]](#). Half of the mothers earned between N31,000-N60,000 a month; increased household income contributes to the household purchasing power and improves their socioeconomic status, thereby enabling households to become food secure.

Majority of the households used pit latrine and water system; this is consistent with the report of [Nigeria Demographic and Health Survey NDHS \[15\]](#). Most of the households used tap and borehole water as their major source of water; this is consistent with the report of [Nigeria Demographic and Health Survey NDHS \[15\]](#). Gas and firewood were used mainly as cooking fuel by the households; this is consistent with the report of [Nigeria Demographic and Health Survey NDHS \[15\]](#) that most households used kerosene as cooking fuel. The study shows that vast majority of the respondent had good health care facility. Majority of the respondents lived in a rented apartment and in a self-contained apartment.

Majority of the respondent said they consumed breakfast every day. Breakfast is the most important meal of the day. The meal commonly skipped was lunch; Lunch is majorly skipped because the care givers or parents may be preoccupied with other things and did not put pressure on the children to eat. Majority of the children consumed snacks; most parents gave their children snacks so they can stay focused at school and keep hunger at bay.

Few of the children were underweight; the prevalence of underweight in this study is lower than that reported in the study conducted by [Jasmine, et al. \[16\]](#) where the prevalence of underweight among school age children was found to be 52.4%. Almost one third of the children were found to be stunted; this is in line with [UNICEF \[9\]](#) report that 32% of children were stunted in Nigeria. Less than one tenth of the children were thin and also overweight. The prevalence of thinness in this study disagrees with the study conducted by [Ene-Obong, et al. \[17\]](#) where prevalence of thinness was 13%.

There was a significant difference between the mother's education, mother's occupation, source of water supply and underweight. This agrees with the study conducted by [Jasmine, et al. \[16\]](#) which found a significant association between socio-economics details of children and undernutrition. There was a significant relationship between mothers' occupation, source of energy, type of toilet, good health facility and stunting. [Olack, et al. \[2\]](#), reported that socio-economic characteristics of parents were determinants of stunting among the school age children. There was a significant relationship between mother's education, source of water supply, source of energy, good health facility, type of housing and BMI-for-age. This agrees with the study conducted by [Jasmine, et al. \[16\]](#) which found a significant association between socio-economics details of the children and undernutrition. Maternal education is the key factor against under nutrition in children.

5. Conclusion

In this study, almost all the children were immunized and about half of the households had a size of 4-6 persons. More than one third of the mothers' had secondary and tertiary education. Most of the households used tap and borehole water as their major source of water. Gas and firewood were used mainly as cooking fuel by the households. Based on the anthropometric status of the children, about 29.6% of the children were stunted, 5.8% were underweight and 2.6% were thin. There was a significant difference between the mother's education, mother's occupation, source of water supply and underweight in the children. Also there was a significant relationship between mothers' occupation, source of energy, type of toilet, good health facility and stunting in the children. There was a significant relationship between mother's education, source of water supply, source of energy, good health facility, type of housing and BMI-for-age in the children. Socio economic characteristics of the mothers was an important factor in the health and nutritional status of children.

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