Knowledge and utilization of vitamin a rich foods among households in Umuahia North local Government area Abia State, Nigeria

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Abstract

Background: Vitamin A deficiency is a public health problem that results from inadequate intake of foods that are rich in vitamin A. This poses a huge health and manpower loss.

Objective: This study aimed at bringing to fore the knowledge and utilization of vitamin A rich foods among households in Umuahia North L.G.A of Abia State, Nigeria.

Methods: A simple random sampling technique was used to select 3 wards out of the 12 wards that make up Umuahia North L.G.A. Systematic random sampling technique was used to select households for the survey. A structured questionnaire was used to capture information relating to socio-economic/ demographic characteristics, knowledge, attitude and practice. The consumption pattern of vitamin A rich foods was captured by means of food frequency questionnaire (FFQ). Mothers were given priority as subjects due to their roles in household food preparation. Descriptive statistics including frequency and percentages was adopted using the statistical package SPSS version 20.

Results: More than a quarter (47.7%) of the respondents were between the ages of 18 to 55 years. They were predominantly Christians of Igbo extraction. About a quarter of the respondents (45.1%) had a family size of 4 to 6 persons. A high percentage of the respondents had formal education above the primary level. Majority of the respondents employed as civil servants and traders. About 19.6% of the respondents earned below 18,000 naira as monthly income. The major sources of awareness for vitamin A rich food were from hospitals and health centres. The Study revealed 35% males and 45% females had poor knowledge towards vitamin A rich food. Palm oil (37.1%) and green leafy vegetable (40.6%) consumption provided the respondents with the highest source vitamin A intake. Icheku (7.7%), Oysters (8.4%), oatmeal (7.8%) and Cod liver oil (8.7%) were consumed less frequently by the respondents.

Conclusion: Promotion of foods rich in vitamin A should be given adequate attention.

Keywords: vitamin a rich foods, knowledge, utilization, households, Abia State, Nigeria.

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1. Introduction

Micronutrient deficiencies continue to impose a substantial health, economic and social burden [2]. Nigeria continues to struggle to maintain adequate nutritional status for the entire population [8]. Among the deficiencies of vitamins and minerals examined globally, the largest disease burdens were attributed to vitamin A and zinc deficiencies [21].

Many developing countries have vitamin A deficiency as a public health problem due to inadequate intake of vitamin A from food [18]. Vitamin A deficiency raises the risk of mortality in children suffering from diarrhea diseases. It also increases the risk of mortality due to measles, prematurity and neonatal infections.

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More than 9 million children and 6 million mothers were vitamin-A deficient in Nigeria and vitamin A deficiency also contributed to 25 percent of infant, child, and maternal mortality in Nigeria [19]. Vitamin A deficiency is also common among older children, adolescents and non-pregnant women. There are two types of vitamin A available in foods namely preformed vitamin A and Pro-vitamin A carotenoids [22]. Preformed vitamin A is found almost exclusively in animal products, such as human milk, glandular meats, liver and fish liver oils (especially), egg yolk, whole milk, and other dairy products. Pro-vitamin A carotenoids are found in green leafy vegetables (e.g. Spinach, Amaranth, and young leaves from various sources), yellow vegetables (e.g. Pumpkins, Squash, and Carrots), and yellow and orange non-citrus fruits (e.g. Mangoes, Apricots and Papayas). As a result of poverty and food crisis, many households have been forced to adopt harmful coping strategies for survival, such as cutting back on food consumption, replacing micronutrient-rich foods with staple foods, selling household and agricultural assets, and increased borrowing, thereby putting many households in financial debt. These actions have long-term negative consequences for nutrition, health and child development. Women and children, who have special nutritional needs, are particularly at risk with negative implications on maternal health and well-being and on the survival, growth and development of children [20]. Until recently, projects that encourage households' own production of food have focused on home gardens that often promote the production foods, whereas limited data exist on the knowledge and utilization of foods rich in Vitamin A. There is a limited data available on the knowledge and utilization of vitamin A rich foods among households in Umuahia and in Nigeria and this has further stressed the need to carry out this study.

2. Materials and methods

The study was carried out in Umuahia North Local Government Area, Abia State. Prior to the survey, a preliminary visit was made to the selected communities in the Local Government Area to inform them and obtain permission to carry out the survey. Ethical approval to undertake the study was obtained from the local government authority. The participants were briefed on the objectives of the study, and their consent was obtained.

Population of the Study: The population focused on mothers in households in Umuahia North LGA.

Study Area: The study was carried out in Umuahia North Local Government Area, Abia State. Umuahia North is a Local Government Area in Abia State with administrative headquarters in the city of Umuahia. The climate is tropical and humid all the year [13]. Umuahia North has a population of 220,660 people. Umuahia North is made up of twelve electoral wards; Urban ward I, Urban ward II, Urban ward III, Ibeku East ward I, Ibeku East ward II, Ndume West ward, Nkwoachara ward, Nkwoegwu ward, Afugiri ward, Umuhu ward, and Isingwu ward. It is largely inhabited by the Igbo people and few people from other tribes. The inhabitants are predominantly farmers, traders, civil servants, and merchants [1].

Sample size calculation: Thus the sample size was calculated using the formula method:

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

Where, N = population size (total number of households in Umuahia North 47,278) [10]

e = level of precision (0.05)

$$\frac{47.278}{1 + 47.278\,(0.0025)} = 396.6$$

Approximately 397 households.

10% of the sample size was added to make up for possible dropouts

397 + 39.7 = 436.7 Approximately 437 households.

Sampling procedure: Umuahia North LGA has 12 wards. Simple random sampling by balloting was used to select 3 wards out of the 12 wards in Umuahia North LGA. Based on NPC, [10] it was estimated that Umuahia north LGA has a total of 47,278 households and each ward has a total of 3,939 households. Systematic random sampling technique was used to select households one out every 27 households for the survey. A total of 145 households were systematically selected from each of the selected 3 wards. In each selected household, a questionnaire was given to mothers as they are responsible for the food preparation in households.

Data collection: A structured validated questionnaire constructed into five sections was used to collect information on socio-economic/demographic characteristics, knowledge, attitude, practice and the consumption pattern of vitamin A rich foods. Food frequency questionnaire was used to assess the consumption pattern of the respondents. The questionnaires were given to the mothers as they are responsible for the food preparation in households while the un-educated among them were assisted.

Data analysis: The knowledge, attitude and practice questions were assigned points. Ten points was awarded for the correct answer while no point was awarded for the wrong answer. Scores between 0-29percent were considered as poor, scores between 30-49% were considered as fair, scores between 50-89% were considered as good, while scores between 90-100% was considered as very good [9]. The Statistical Package for Service Solution (SPSS) version 20 [6] was used to analyze the data. Data from the questionnaires were coded and keyed into the computer. Descriptive statistics (frequency and percentage) were obtained.

3. Results

Table 1 shows the background information of the subjects. Majority (82.0%) of the respondents were females, while 18% were males. About 47.7% of the subjects were between 18-35 years, while 38.8% were between the ages of 36-55 years, only 11.4% were 56 years and above. A vast majority (97.0%) of the subjects were Christians. Only a few (2.8%) practice Islamism, an insignificant number (0.2%) were traditionalists. Majority of the respondents (90.7%) were Igbos, about 7.2% of them were Yoruba, and 1.9% of them were Hausas. A quarter (45.1%) of the respondents had a household size of 4-6 persons, while 22.0% had a household size of between 1-3 persons, another 11.9% had a household size of above 7 persons.

Table 1. Background information of the respondents

Variables	Frequency	Percent
Sex		
Male	77	18
Female	351	82
Total	**428**	**100**
Age		
18-35 years	204	47.7
36-55 years	166	38.8
56 years and above	49	11.4
Total	**428**	**100**
Religion		
Christianity	415	97
Islam	12	2.8
Traditionalist	1	0.2
Total	**428**	**100**
Parent's ethnicity		
Igbo	388	90.7
Yoruba	31	7.2
Hausa	8	1.9
Others	1	0.2
Total	**428**	**100**
Family size		
1-3 Persons	94	22
4-6 Persons	193	45.1
5-7 Persons	90	21
Above 7 Persons	51	11.9
Total	**428**	**100**

Table 2. Demographic characteristics of the respondents

Variables	Frequency	Percent
Type of roofing		
Thatch	13	3
Corrugated iron sheet	79	18.5
Aluminum sheet	286	66.8
Synthetic roofing sheets	48	11.2
Others	2	0.4
Total	**428**	**100**
Source of drinking water		
Sachet water	143	33.4
Bottle water	42	9.8
Borehole water	232	54.2
Others	11	3.7
Total	**428**	**100**

Table 2 shows the demographic characteristics of the respondents. More than half of the respondents (66.8%) lived in houses roofed with aluminum sheets, some (18.5%) lived in houses roofed with corrugated iron sheets. About 11.2% lived in houses with synthetic roofing sheets. Only few (3.0%) of the respondent's lived in houses with thatch roof. About half (54.2%) of the respondents drank water from boreholes, one third (33.4%) said they drank sachet water while only a few (9.8%) said they drank bottled water.

Table 3 shows the socio-economic characteristics of the parents. About 46% of the mothers and fathers had secondary education, while 32.7% of the mothers and 32.5% of the fathers had tertiary education. Only a few mothers (5.4%) and fathers (4.0%) had no formal education. About 34.6% of the fathers and 32.5% of mothers were traders/business people. About 4.9% of the fathers and 13.3% of the mothers were not employed. About 12.4% of the mothers and 14% of the fathers were engaged in farming. About 24.1% of the parents had monthly family income ranging from ₦19,000 to ₦39,000 naira, while 6.3% had monthly family income ranging from ₦81,000 to ₦100,000 naira.

Table 4 shows the sources of awareness of about vitamin A rich foods among households. Most (66.6%) of the households said they were aware and have heard about vitamin A rich foods, one third of the respondents (33.4%) said they were not aware or have heard about vitamin A rich foods.

About 54.7% of the respondents said they heard about vitamin A rich foods from hospitals/health centers. The other respondents said they heard about it through radio (9.1%), television (10.1%), friends and relatives (7%), newspaper and magazine (3.8%), schools (9.1%), books/internet (0.7%) and church (0.2%).

Table 5 shows the knowledge of households towards vitamin A rich food sources according to gender. The table revealed that 35% of male subjects had poor knowledge of vitamin A rich food sources while 45.8% of the female subject had poor knowledge towards vitamin A rich food sources. About 44.1% of the male subjects had fair knowledge, while some 26.2% of the female subjects had a fair knowledge towards foods rich in vitamin A. Very good knowledge of vitamin A rich food sources were observed in 6.4% of the males and 11.9% of female respectively.

Table 6 shows the perception of the subjects towards vitamin A. About 96.7% of the subjects had a wrong perception that vitamin A could prevent night blindness. About 3.3% had a correct perception that vitamin A could prevent night blindness. About 91.8% of respondents had a wrong perception that animal sources of foods can help provide vitamin A, while 8.2% had correct perception towards animal sources and vitamin A. About 93.9% of the respondents had a wrong notion about green leafy vegetables consumption having the ability to provide vitamin A in the body. Only 6.1% of the respondents belief that green leafy vegetables could provide vitamin A to the body.

About 81.3% of the respondents are of the view that eating enough food was more important in preventing night blindness than eating vitamin A rich food; A few (18.7%) think in the contrary and have correct attitude. About 5.1% of respondents had a wrong attitude and said there was no difference between plant and animal sources of vitamin A, while 94.9% believed vitamin A content of plant and animal sources was different.

About 75.2% of subjects had a wrong attitude towards vitamin A fortified foods, while 24.8% had a correct attitude. About 50.7% of the subjects were of the view that supplementation was the best way to improve vitamin A status in the body, while 49.3% of subject held contrary view.

Table 3. Socio-economic characteristics of the parents

Variables	Frequency	Percent
Education of mothers'		
No formal education	23	5.4
Primary education	68	15.9
Secondary education	197	46
Tertiary education	140	32.7
Total	**428**	**100**
Education of fathers'		
No formal education	17	4
Primary education	74	17.3
Secondary education	19	46
Tertiary education	140	32.5
Total	**428**	**100**
Occupation of mothers'		
Not employed	57	13.3
Civil servant	103	24.1
Farmer	53	12.4
Trader/business	139	32.5
Self employed	76	17.8
Total	**428**	**100**
Occupation of fathers'		
Not employed	21	4.9
Civil servant	124	29
Farmer	60	14
Trader/business	148	34.6
Self employed	75	17.5
Total	**428**	**100**
Family's monthly income		
Less than ₦18,000	84	19.6
₦19,000 - ₦39,000	103	24.1
₦40,000 - ₦60,000	95	22.2
₦61,000 - ₦80,000	36	8.4
₦81,000 - ₦100,000	27	6.3
₦100,000 and Above	83	19.3
Total	**428**	**100**

Table 4. Awareness of vitamin A rich food among households

Variables	Frequency	Percent
Vitamin A awareness		
Yes	285	66.6
No	143	33.4
Total	**428**	**100**
Source of awareness		
From hospital / health centers	156	54.7
From radio	26	9.1
From television	29	10.1
From friends / relatives	20	7
From newspapers / magazine	11	3.8
School	26	9.1
Books/internet	2	0.7
Church	1	0.2
Others	14	4.9
Total	**285**	**100**

Table 5. Knowledge of households towards vitamin A rich food sources

Level of knowledge	Male		Female		Total	
	Freq	**%**	**Freq**	**%**	**Freq**	**%**
Poor knowledge (0-29)	27	35.0	161	45.8	188	43.9
Fair knowledge (30-49)	34	44.1	92	26.2	126	29.4
Good knowledge (50-89)	11	14.2	56	15.9	67	15.6
Very good knowledge (90-100)	5	6.4	42	11.9	47	10.9
Total	**77**	**100**	**351**	**100**	**428**	**100**

Table 6. Perception of respondents towards vitamin A

Variables	Frequency	Percent
Vitamin A prevents night blindness		
Wrong perception	414	96.7
Correct perception	14	3.3
Total	**428**	**100**
Animal source foods provide vitamin A		
Wrong perception	393	91.8
Correct perception	35	8.2
Total	**428**	**100**
Green leafy vegetables provide vitamin A		
Wrong perception	402	93.9
Correct perception	26	6.1
Total	**428**	**100**
Eating enough food is more important in preventing night blindness than eating vitamin A rich foods		
Wrong perception	348	81.3
Correct perception	80	18.7
Total	**428**	**100**
There is no difference in the vitamin A content of plant and animal source		
Wrong perception	22	5.1
Correct perception	406	94.9
Total	**428**	**100**
Using more vitamin A fortified foods has no impact on Vitamin A status		
Wrong perception	322	75.2
Correct perception	106	24.8
Total	**428**	**100**
Supplementation is the best way to improve vitamin A status		
Wrong perception	217	50.7
Correct perception	211	49.3
Total	**428**	**100**

Table 7 shows the utilization of vitamin A rich foods by households. About 43.9% of subjects utilized vitamin A rich foods as main meals. This was closely followed by 38.8% that utilize vitamin A rich foods as appetizers. Consumption of vitamin A rich food as snacks was recorded by 10.0% of the respondents. Majority (98.1%) of the respondents consumed fruits and vegetables. Only a few (1.9%) of them did not consume fruits and vegetables. About 94.9% of subjects said they included fruits and vegetables in their favorite meals, while 5.2% said they did not include fruits and vegetables in their favorite meals.

Table 8 shows the frequency of consumption of some selected vitamin A rich foods. The highest daily consumption of vitamin A rich foods by the respondents were from green leafy vegetable (40.9%). Milk (38.3%), tomato (28.7%) and Watermelon (20%) were also consumed daily by the respondents. The animal sources of vitamin A including liver (9.4%), heart (9.0%) and kidney (9.6%) were consumed daily by a few of the respondents. Liver (28.1%), Green leafy vegetable (7.8%), pawpaw (34.6%) and orange (32.2%) were consumed once weekly by the respondents. About 30.9% of the respondents consumed bitter leaf once weekly. Pawpaw (26.8%), apple (26.9%) and watermelon (29.2%) were consumed 2-3 times weekly by the respondents. The highest consumption of vitamin A at 2-3times weekly was from Fish (35.3%) and tomato (32.5%) respectively. Cod liver oil (8.7%) and icheku (*Dialium guineense*) (9.2%) had the least consumption rate at 2-3times weekly by the respondents. Palm oil (27.8%), liver (7.1%), heart (4.4%) and green leafy vegetable (29.2%) were consumed above 4times weekly by the respondents. Least consumption of oysters (5.6%) and egg (4.9%) at above 4times weekly was observed among respondents. Liver (32.5%), heart (44.7%), kidney (38.1%) and carrots (31.5%) were rarely consumed by respondents. Rare consumption of mango (38.7%), plum (56.3%), oatmeal (49.9%) and oyster (59%) were recorded from the respondents.

Table 7. Utilization of vitamin A rich foods by households

Variable	Frequency (F)	Percent (%)
Utilization of vitamin A rich foods		
As main meal	188	43.9
As appetizer	166	38.8
As snacks	43	10
As appetizer and as main meal	20	4.7
Others	11	2.6
Total	**428**	**100**
Consumption of fruits and vegetables		
Yes	420	98.1
No	8	1.9
Total	**428**	**100**
Inclusion of fruits and vegetables in favourite meals		
Yes	406	94.9
No	22	5.2
Total	**428**	**100**

Table 8. Frequency of consumption of some selected vitamin A rich foods

Variables	1-3x daily		Once weekly		2-3x weekly		Above 4x Weekly		Rarely		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
Palm oil	159	37.1	60	14	79	18.5	119	27.8	11	2.6	428	100
Liver	40	9.4	119	28.1	97	22.9	30	7.1	138	32.5	424	100
Heart	37	9	103	25	70	17.0	18	4.4	184	44.7	412	100
Kidney	39	9.6	92	22.5	80	19.6	34	8.3	163	38.1	408	100
Carrot	71	16.9	84	20	97	23.1	33	7.9	135	31.5	420	100
Green leafy vegetable	174	40.9	33	7.8	87	20.5	124	29.2	7	1.6	425	100
Pawpaw	76	17.9	147	34.6	114	26.8	33	7.8	55	12.9	425	100
Apples	65	15.5	107	25.5	113	26.9	34	8.1	101	24	420	100
Mango	42	10	89	21.1	86	20.4	41	9.7	163	38.7	421	100
Watermelon	84	20	102	24.2	123	29.2	53	12.6	59	14	421	100
Orange flesh sweet potato	43	10.1	52	12.2	57	13.3	44	10.3	231	54.1	427	100
Milk	164	38.3	71	16.6	109	25.6	56	13.1	28	6.5	428	100
Fish	108	25.4	85	20.0	150	35.3	75	17.6	7	1.6	425	100
Orange	93	21.7	138	32.2	120	28	45	10.5	30	7	426	100
Plum	44	10.4	59	13.9	55	13	27	6.4	238	56.3	423	100
Oatmeal	33	7.8	61	14.4	84	19.8	35	8.2	212	49.9	425	100
Tomato	122	28.7	80	18.8	138	32.5	78	18.4	7	1.6	425	100
Bitter leaf	72	17.1	130	30.9	114	27.1	46	10.9	59	14	421	100
Avocado	50	11.7	103	24.1	110	25.8	57	13.3	107	25.1	427	100
Cod liver oil	36	8.7	57	13.8	36	8.7	57	13.8	227	55	413	100
Icheku (*D. guineense*)	32	7.7	43	10.4	38	9.2	28	6.8	273	65.9	414	100
Oysters	33	8.4	58	14.8	48	12.2	22	5.6	232	59	393	100
Egg	92	21.5	107	25	95	22.2	21	4.9	112	26.2	427	100
Sweet potato	56	13.2	84	19.8	89	21.1	50	11.8	149	34.1	428	100

Discussions

A vast majority of the subjects were Christians. This is expected because Abia State is a predominantly Christian State. This is in agreement with the study of Jegede [7], which stated that Christianity in Nigeria started from the South Eastern part of Nigeria. This study area is predominantly occupied by the Igbos. It is noteworthy to mention that Igbos constitute the majority tribe in the study area. The low percentage of households with thatched roofs connotes that most of the households were of average socioeconomic background. The drinking water sources apart from boreholes may not be improved sources of drinking water supply [12]. The educational trend observed in the study is expected because Abia State ranks relatively higher in respect to education than most States in Nigeria. This has been previously reported by Ekumankama and Igbokwe [3]. The high percentage of business people and civil servants in the study is expected because Umuahia is a commercial city with lots of buying and selling. More than half of the respondents had awareness about vitamin A rich foods from hospitals and health centers.

Being a commercial capital city, health care centers are accessible; this finding is in agreement with Rahman and Sapkota [17] who reported that 51.3% of mothers heard about vitamin A rich foods from health workers. Female respondents had a better knowledge of vitamin A rich food sources than the males. This could be as a result of the fact that females were responsible for meal planning, purchase and preparation in the households. The poor knowledge of vitamin A rich food sources is worrisome considering the literacy level in the study area. Similar result was reported by Olowoniyan *et al*., [14] who reported that the lack of knowledge was due to the fact that most of the vitamin A rich foods were used in traditional medicine rather than enrichment of meals. Many of the respondents had a wrong perception and beliefs on vitamin A rich foods. This wrong perception may be due to their beliefs and lack of basic information on Vitamin A and its sources. The subjects were more concerned on satisfying hunger while being victims of hidden hunger. Most of the respondents did not know that animal sources were good sources of vitamin A.

Eggs and milk can also provide a meaningful source of vitamin A in the diets, even in some low income settings [15]. Because vitamin A levels in liver are so high, small amount can be useful [23]. Thus, relatively small quantities of animal-source foods can have a large impact on vitamin A status [4]. More than half of subjects had a wrong perception towards vitamin A fortified foods having no impact on vitamin A status in the body. This could be as a result of limited information and ignorance on vitamin A fortified foods. The major utilization route of vitamin A rich foods was through main meal and appetizer. This may be due to cultural beliefs and food habits in the area of study do not combine appetizer and main meals. Majority of the respondents consumed fruits and vegetables. This connotes that even though the knowledge of the respondents towards the food sources of vitamin A was mostly poor, the consumption of vitamin A rich foods were quite high. The staple foods consumed in the study area were mostly prepared with vegetables and palm oil; these are consumed as main meals and could be an explanation as to why it was the major utilization route of vitamin A rich food. The highest daily consumption of vitamin A rich food was from green leafy vegetable. This may be so because these plant food sources of vitamin A were available and affordable in the study area. The consumption of green leafy vegetables in the study area compares well with the findings of Harts *et al*. [5] who reported that majority of households in Igwuruta and Port Harcourt, consumed leafy vegetables more than four times per week. Some respondents consumed pawpaw, mango, apple and watermelon 2-3 times weekly because these fruits were available and affordable in the study area. The highest consumption of vitamin A at 2-3times weekly was from Fish and tomato. This may be because fish and tomato are mostly used in the preparation of meals frequently consumed by respondents. From personal communication with the respondents, there was this notion that egg predisposes one to disease like high cholesterol and heart attack hence their limited consumption. Liver, heart, kidney and carrots were rarely consumed by the respondents. This may be so because of the scarcity and high cost of these animal sources of vitamin A.

Conclusion

This study revealed that there was poor knowledge and perception on vitamin A rich foods in Umuahia North LGA of Abia State. The major source of awareness of vitamin A rich foods was from hospital/health centers. It was obvious that vitamin A rich foods were consumed without prior knowledge of it and subsequent health benefits. There is poor knowledge and bias towards animal sources of vitamin A. There is need for nutrition education on the importance and promotion of foods rich in vitamin A.

Compliance with Ethics Requirements. Authors declare that they respect the journal's ethics requirements. Authors declare that they have no conflict of interest and all procedures involving human or animal subjects (if exist) respect the specific regulation and standards.

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