

Research Article

Food Consumption Pattern, Anthropometric and Haemogobin Status of Women (15-50 yrs) In Ukpo Dunukofia, Anambra State

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Abstract

Objectives: A community based cross-sectional survey was conducted to assess the food consumption pattern, anthropometric and haemogobin status of women of child bearing age (15-50 yrs) in Ukpo Dunukofia, Anambra State.

Methodology: A total of 380 subjects, 95 from each of the four villages of Ukpo were purposively selected. Validated and pre-tested questionnaire was used to obtain information on the socio-economic background and weekly food consumption pattern of the subjects. While 24 hour-dietary recall was used to determine the frequency of daily consumption of iron rich foods among the subjects. The anthropometric and haemoglobin status of the subjects were determined by comparing the body mass index (BMI), waist –to-hip ratio (WHR) and heamoglobin level with standard references.

Results: Result showed that majority of the subjects were mostly single (49.5%) and within the active age (87.7%). Senior School Certificate Examination (SSCE) was majorly (52.9%) the highest education qualification found among the subjects, with monthly income of \leq N 15,000 (40.7%). The result on food consumption pattern reveals that starchy root and tuber food crops were highly consumed (82.6%) on weekly basis and frequently consumed (48.2%) daily by the subjects. Prevalence of obesity (7.1%), underweight (17.9%), overweight (27.4%) and central obesity (67.1%) was observed among the subjects. Haemoglobin level of the subjects shows moderate (52%) and severely (11%) anemic.

Conclusion: The poor food consumption pattern of the subjects influenced their anthropometric and hemoglobin status. Awareness on the micronutrient rich foods and adequate consumption of foods rich in iron should be extended through nutrition education to the Ukpo Dunukofia Community in Anambra State, Nigeria.

Keywords: Food consumption; Haemoglobin; Body mass index; Waistto-hip-ratio; Women; Anaemia

Introduction

Hemoglobin as defined by Encyclopedia Britannica is an iron-containing protein in the red blood cells of vertebrates that transports oxygen to the tissues [1]. Low haemoglobin level in the red blood cells results in an abnormal condition known as anaemia. Anemia is typically defined as hemoglobin level of less than 13.5 gram/100 ml in men and less than 12.0 gram/100 ml in women [2]. Anemia or low concentration of hemoglobin (Hb) is a condition in which the number of red blood cells of the body is insufficient to meet physiological needs [3]. Anemia is caused by either a decrease in production of red blood cells/hemoglobin (iron deficiency anaemia), or an increase in blood loss (usually due to bleeding) or destruction of red blood cells. The World Health Organization (WHO) classified the public health significance of anemia based on the prevalence estimated from blood levels of hemoglobin (normal, <4.9%; mild, 5.0–19.9%; moderate, 20.0–39.9%; and severe, $\geq 40.0\%$) [3].

Iron is one of the most abundant elements in the earth crust, yet iron deficiency anaemia is among the commonest nutritional disorder worldwide. This may be due to the limited capacity of the human body to absorb dietary iron, especially from plant food sources. Dietary iron is a mineral found in every cell of the body and also naturally present in many foods, added to some food products and available as dietary supplements [4]. Iron is seen both as a part of haemoglobin in the blood and myoglobin in the muscles that serve as carrier of oxygen in the body [5]. Iron is an important trace mineral which is present in two forms (non-haeme and haeme iron) depending on the type of food. Non-haeme

iron is usually much less well absorbed than haeme iron [6]. An average person needs to absorb small amount of iron each day to stay healthy, 1 mg for adult male and 1.5 mg for menstruating females [7].

Children, women of reproductive age, and pregnant women are at high risk of developing anemia [8,3]. Global, prevalence of anemia among women of reproductive age in 2011 is about 528.7 million (29%) [9]. According to 2014 Global Nutrition Report, 49% of women of reproductive age in Nigeria are anaemic [10]. The most frequent cause of iron deficiency anaemia among women of child bearing age is through the loss of iron in blood during mensuration, and by poor diet [11]. The recommended Dietary Allowance (RDA) of iron for women of child bearing age is 18 mg/day [7]. This is not usually met due to the poor intake of iron rich foods among women of child bearing age in the developing world and or lack of knowledge on iron containing foods (plants and animal alike). This usually leads to persistent low consumption or inadequate intake of

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iron available rich foods.

Food consumption pattern is referred to as the combinations of foods that constitute an individual's usual dietary intake, which includes daily and longer cyclical variations [12]. Beyond having nutrition knowledge of foods, socio-economic status may greatly influence a person's food consumption pattern. Research in developing countries show that as income increases, the poorest households spend a major share of their additional income on food expenses. This increase in the food budget resulting from rise in income is manifested by increased quantity as well as improved quality of the food [13]. According to Archana and Begum urban women have better access to a variety of food items with respect to food consumption [14].

Moreover, culture and socio economic status of a population influence food choices and consumption, while consumption of some food items is likely to vary according to season and often based on availability and price [13,14]. The present research is designed to investigate the impact of food consumption pattern on the Body Mass Index (BMI), Waistto-Hip-Ratio (WHR) and haemoglobin status of women (18-50 yrs) of reproductive age in Ukpo Dunukofu LGA, Anambra State, Nigeria.

Methodology

Study area

The study was carried out in Ukpo Dunukofia LGA of Anambra State. Ukpo Dunukofia is made up of four villages Oranto, Isekwu, Akpu and Akaezi. It covers a land mass of 6.20000 C latitude and 6.9667 OC longitude [15].

Research design

This study was a cross sectional survey that involved women of child bearing age in Ukpo, Dunukofia LGA of Anambara State, Nigeria.

Population and sampling

The sample size was calculated from the estimated total population of 5,428 women within the targeted age bracket, using the method of Taro Yahmen [16]. A sample size of 380 women was selected through a purposively sampling technique. Apparently, ninety-five (95) women from each of the four villages.

Data collection

A well-structured questionnaire validated by lecturers in the Department of Nutrition and Dietetics, Imo State University, Owerri was administered to the subjects after pre-tested. The questionnaire was used to elicit information on the socio-economic background and food consumption pattern from the subject. The 24-hr-dietary recall was used to obtain information on the frequency of consumption of iron rich foods by the subjects.

Anthropometric measurements, height and weight of the subjects was measured using the standard methods of Jelliffe and Jelliffe [17]. Height measurement; the height of the individual women was taken using constructed vertical wooden rod affixed with graduate fiber glass tape. Subjects stood barefooted and readings were taken on the nearest 0.1 cm.

Weight measurement; the weight of the individual women was measured with light clothing, hair fitting and bare footed using portable bathroom scale (HANSON Model) to nearest 0.1 kg)

Body Mass Index (BMI)

The standard procedure of WHO was adopted in calculating the BMI of subjects, using the height and weight measurements;

BMI=Weight (kg)/Height (m²).[18]

Following the WHO recommended methods; the waist circumference of subjects was measured at the midpoint between the lower margin of the last palpable rib and the top of the iliac crest using a stretch-resistance tape (tailors tape) [19].

On the other hand, the hip circumference was measured around the waist portion of the buttocks parallel to the floor. The subjects were made to relax before measurements were taken. Measurements were taken in duplicate.

Waist -Hip Ratio (WHR)

The WHR of subjects was calculated using the standard formula:

WHR=Waist circumference (cm)

Hip circumference (cm)

Results

Biochemical assessment

Blood samples were collected from the forearm of the subjects after cleaning with swab soaked in methylated spirit. Haemoglobin pipette was used to draw 0.2 mls blood. Samples collected were transferred into ethylene Diamine Tetra acetic acid (EDTA) bottles. The samples were carried in icebox and transported to the Hematology Laboratory of the Federal Medical Center Owerri within a period of 12 hours for haemoglobin determination. Haemoglobin was estimated by Cyanmethamoglobin method using Drabkin solution [20].

Data analysis: Data obtained from the biochemical analysis was expressed in frequency and percentages. Anaemia was defined as haemoglobin value <11.0 g/l, while severe anaemia was defined as haemoglobin value <8.0 g/l [21]. The Body Mass Index (BMI) in kg/m2 was classified as follows; <18.5=underweight, 18.5-24.9=normal; 25-29.9=overweight; >30 kg/m2=obesity [18]. Central obesity was classified as WHR; <0.75=normal; >0.8=high [19].

Statistical analysis: Data generated from the questionnaire and dietary assessment were coded and keyed into excel spread sheet and later summarized with a Statistical Package for Social Sciences (SPSS version 20.0).

Discussion

Table 1 revealed that majority of the subjects were between the ages of 15-40 yers, as they constituted the larger population (87.6%), and most of them were still single (49.5%). The major occupation of the subjects was found to be petty trading (37.9%), and most of the subjects were within the low income group of \leq 15,000 monthly. Ironically, more than 50% (54.5%) of the subjects was found to be having large family size of 4-6 members with the limited resources.

Variables	Frequency	Percentages	
Age in years			
15-20	66	17.4	
21-30	146	38.4	
31-40	121	31.8	
41-50	47	12.4	
Total	380	100	
Marital status			
Single	188	49.5	
Divorced	48	12.6	
Widow	43	11.8	
Married	99	26.1	
Total	380	100	
Family size			
2-3 members	109	28.6	
04-Jun	207	54.3	
07-Dec	48	12.6	
>12 members	16	4.2	
Total	380	100	
Occupation			
Civil servant	41	10.8	
Artisan	26	6.8	
Banker	44	11.5	
Trader	144	37.9	
Housewife	125	32.8	
Total	380	100	
Educational background			
FSLC	39	10.3	
JSSCE	49	12.9	
SSCE	201	52.9	
OND	29	7.6	
HND/B.Sc	62	16	
Total	380	100	
Monthly income			
≤ 15,000	155	40.7	
15,000-25,000	98	25.8	
26, 000-40,000	76	20	
41,000 above	51	13.4	
Total	380	100	

Table 1: Socio-economic characteristics of subjects.

Result of the weekly food consumption pattern (Table 2) revealed that starchy root and tuber based foods were mostly consumed (80.6%) by the subjects, followed by legumes (54.2%). Similarly, 24-hour dietary recall showed that roots and tuber food products were consumed three times daily among 48.2% of the subjects followed by meat and fish products

(33.7%) twice daily (Table 3). This finding agrees with the report of Ene-Obong and Ekweagwu where 24-hour dietary recall showed that majority of the households studied mostly consume cassava based diets for breakfast and dinner in Ebonyi State, Nigeria [22]. Similarly, Agugo, Asinobi and Afam-Anene reported cassava based products as the most frequently consumed food products in selected motherless and orphanage homes in Imo State [23]. The high consumption of root and tuber based products may be attributed to the availability and cost the food products, since most of the subjects were of the low income group. This could also be linked to the high percentage of overweight (27.4%) and central obesity (67.1%) recorded among the subjects (Table 4). Majority of the subjects was found to be at the moderate (46.3%) risk of developing cardiovascular/metabolic diseases (0.80 - 0.85) while 20% were at the high risk (≥ 0.85) according to WHO [19]. With respect to WHR, previous researches have reported higher percentage (77.1%-79.5%) of central obesity among women in different parts of Nigeria which signifies risk of developing metabolic and cardiovascular diseases [24,25].

Food mound	Frequency			
rood groups	Mild	Moderate	High	
	n(%)	n(%)	n(%)	
Root and tuber	77(20.3)	189(49.7)	114(30.0)	
Cereals and grain	33(8.6)	54(14.2)	206(54.2)	
Legumes	88(23.2)	168(44.2)	124(32.6)	
Meat/fish / poultry	191(50.3)	107(28.2)	80(21.1)	
Milk products	19(5.0)	47(12.4)	314(82.6)	
Fruits and vegetables	198(52.1)	100(26.3)	82(21.6)	
Snacks	169(44.5)	166(43.7)	45(11.8)	
Vegetable	169(44.5)	166(43.7)	45(11.8)	

Table 2: Result of weekly food consumption pattern of subjects.

Г 1	Frequency		
Food groups	Mild	Moderate	High
	n(%)	n(%)	n(%)
Root and tuber	89(23.4)	108(28.4)	183(48.2)
Cereals and grain	64(16.8)	112(29.5)	94(24.7)
Legumes	64(16.8)	16(4.2)	28(7.4)
Meat/fish / poultry	49(12.9)	128(33.7)	38(10.0)
Milk products	34(8.9)	18(4.7)	28(7.4)
Fruits and vegetables	(86(22.6)	33(8.7)	25(5.8)
Snacks	58(15.3)	29(7.6)	22(5.8)
Vegetable	169(44.5)	166(43.7)	45(11.8)

 Table 3: Result of 24-hour dietary recall of food and snacks consumed by the subjects.

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Variable	Category	Frequency	Percentage
BMI (Kg/M ²)			
<18.5	Underweight	68	17.9
18.5-24.9	Normal	181	47.6
25.0-29.5	Overweight	104	27.4
≥ 30	Obese	27	7.1
Total		380	100
Waist-to-hip	ratio		
<0.75	Excellent	39	10.3
0.75-8.0	Good	86	22.6
0.80-0.85	Moderate risk	176	46.3
>0.85	High risk	79	20.8
Total		380	100
* Reference St	andard (WHO, 2020); WHO, 2008)	

Table 4: Anthropometric status of subjects.

The high prevalence of overweight found in this study agrees with the range (20.3%-35.1%) reported by previous researchers in a systematic review of Nigerians among female undergraduate students in Nsukka and rural urban community of Delta State all in Nigeria [26-28]. The prevalence of obesity (7.1%) in this research is slightly lower than the range (8.1-22.2%) reported by Eze et al. [27].

The low consumption of vegetables and high consumption of carbohydrate rich foods corresponds with previous research on food consumption pattern of women in Nigeria [28]. The high legume consumption found among the subjects corresponds with the rate reported by Eze but in contracts with the consumption level of legumes among female undergraduate students of University of Nigeria Nsukka [27,29]. In the midst of the limited resources, the consumption of meat and fish products (32.6%) observed among the subjects was high compared to earlier research reports (10.5%) and 4.3% [27,29]. This study revealed high level of moderate (51.8%) and severe (11.3%) anaemia among the subjects, despite the high (53.8%) consumption of animal products recorded (Table 2). This could be attributed to the quantity of milk, meat and fish products consumed by the subjects, which was regular (twice daily) as seen in Table 3, but inadequate to improve the iron status of the consumers. The result on Heamoglobin status of subjects (Figure 1) did not correspond with the moderate level (16.7%) of anaemia reported by Eze among pregnant women in Nsukka and 35.3% among pregnant women in Nigeria on the outcome of the 2001-2003 Nigeria food consumption and Nutrition Survey reported [30,31].



Figure 1: Haemoglobin status of subjects.

Conclusion

The socio-economic background of the subjects was generally poor. There was low consumption of iron rich foods among the population studied. Starchy based food products were mostly consumed instead. The observed poor socio-economic background and inadequate food consumption pattern especially, iron rich foods influenced the anthropometric and haemoglobin status of the subjects resulting in the prevalence of overweight, central obesity and anaemia.

Recommendation

The women of Ukpo Dunukofu Local Government Area in Anambra State, Nigeria need nutrition education to enable them make right food choices.

Awareness on the available iron rich foods and their proper utilization need to be created among women of child bearing age in the studied population

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