KNOWLEDGE, PATTERN AND DETERMINANTS OF FRUIT AND VEGETABLE CONSUMPTION AMONG LOW INCOME CIVIL SERVANTS IN ZARIA METROPOLIS, NIGERIA.

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ABSTRACT*:*

The health benefits of eating fruits and vegetables are numerous as confirmed by several studies. This has informed the recommendation that at least 400g of fruits and vegetable be taken per person per day. However, the knowledge and intake of this essential aspect of nutrition is globally poor, more so among low income consumers. This study sought to elicit the knowledge, pattern and determinants of fruits and vegetable consumption among low income civil servants in Zaria metropolis Nigeria. A multi-stage sampling procedure was adopted in selecting four (4), government establishment and 310 respondents on salary grades level (GL) 01-06. Data generated from the interview of respondents using a structured questionnaire were analyzed using both descriptive and inferential statistics. Results show that knowledge of health benefits was high at 83.8%, while actual consumption of regular basis was low at 33.4%. The consumption pattern for specific fruits and vegetables further revealed very dismal intake levels. Among the consumption determinants, age (r=0.133) was significant at p<0.05, while sex (r=0.256), family size (r=0.074), educational levels (r=0.135) and salary grade level (=0.057) were statistically significant at p<0.01 level respectively. Constraints limiting consumption were identified and ranked to include poor wages/salaries competing demands on income and high cost of fruits and vegetables in that order. Recommendations factored on mass sensitization have been proffered with a view to improving availability and consumption levels

Key Words: Knowledge Determinants Consumption Fruits Vegetables

INTRODUCTION

Globally, food insecurity is one of the major challenges facing humanity today. This explains a situation where people are under-nourished as a result of the physical unavailability of food, the lack of social or economic access to adequate food and/or inadequate food use. According to Webb & Rogers (2009), food-insecure people are those whose food intake falls below their minimum calorie (energy) requirement, as well as those who exhibit physical symptoms caused by energy and nutrient deficiencies resulting from an inadequate or unbalanced diet or from the body's inability to use food effectively, because of infection or disease.

In Nigeria, food insecurity is palpable. According to Olarewaju (2012), "Nigerians are currently groaning under the weight of rising prices of food items. This is underscored by the seeming daily upsurge in the price of food items forcing many to believe that the country may be facing serous food shortage".

It is important in discussing food insecurity/shortages to note that quality of food is as important as quantity available. In other words, while emphasizing the calorie and protein requirements, attention must also be paid to the micronutrients- vitamins and minerals-very essential to healthy living. It is in this regard that fruits and vegetables attract deserving prominence. Among the various foods, production and consumption of fruits and vegetables are of crucial importance. This is because of their contribution to good health and as cheap

sources of minerals and vitamins needed to supplement people's diet which are mainly carbohydrates (Oladoja Akingbile & Adisa, 2005).

Fruits and vegetables are parts of plants that are consumed whole or in parts, raw, cooked or processed into juice or other more durable forms. Fruits and vegetables are known to contain several vitamins and minerals and they are low in fats and sodium and also provide dietary fibre.

Worthy of note is the fact that no single fruit or vegetable provides all the nutrients required to be healthy. Citrus fruit for example contains ascorbic acid and other useful nutrients and vitamins and prevents constipation. Apart from helping to quench thirst, oranges also help to prevent several diseases like asthma, cancer and hypertension. Oranges are also known to help fight diabetes and heart disease, due to the presence of flavonoids in oranges (Center for Disease Control (CDC) 2010; Pamplona-Roga, 2003). On their part, vegetables have a low glycaemia index and foods of low glycaemic index are associated with low risk of type II diabetes and coronary heart diseases, prolonged satiety response which leads to weight control (Joffe & Robertson, 2001).

In all, variety is as important as quantity and diets rich in both fruits and vegetables provide the best health results. Such diets can lower blood pressure, reduce risk of heart diseases and stroke, prevent some types of cancer, lower risk of eye and digestive problems and have positive effect upon blood sugar which can help keep appetite in check. It is estimated that up to 2.2 million lives could potentially be saved each year if fruits and vegetables are sufficiently consumed (World Health Organization (WHO), 2002; Joffe & Robertson, 2001).

PROBLEM STATEMENT AND OBJECTIVES

The health benefits of eating fruits and vegetables are numerous as confirmed by several studies. This has informed the recommendation that at least 400g of fruits and vegetables be taken per person per day (WHO, 2003). However, according to Banwat, *Lar, Dabor, Audu & Lassa (2001)*, the knowledge and intake of this essential aspect of nutrition is globally poor. Results indicate that vegetable consumption in sub-Saharan Africa (SSA) is about 27-114 kg/capita/year which is below the WHO/FAO recommendations of 146 kg/capita/year (WHO, 2005). Unfortunately, many studies have also reported low fruit and vegetable consumption across different populations.

Evidently, low intake of fruits and vegetables can only result in negative consequences-morbidity and mortality. Schneider, Alexander & Stager (2007) reported that low fruits and vegetable intake accounted for 3.2% of total death in South Africa. Vivid statistics of the consequences of under-nutrition in Nigeria abound and include:

- Low micronutrient levels among pregnant women being a leading contributor to low infant birth weight;
- About 41% of children under age 5 are stunted, 23% are underweight and 14% are wasted;
- Global rating of stunting prevalence in Nigeria is 32nd highest out of 136 countries;
- The economic costs of under-nutrition include direct costs such as increased burden on the healthcare system and indirect costs of lost productivity (WHO, 2002; World Bank, 2009; UNICEF 2009);

Challenges emanating from protein, vitamin and fat and other minerals nutrient deficiencies have led to searching for ways of making these nutrients available and affordable (UNICEF, 2004). This issue of affordability has informed the thrust of this study regarding the knowledge and consumption pattern of low income consumers towards the consumption of fruits and vegetables. These low income consumers by virtue of their limited financial capacity, can ill afford the common sources of these micronutrients – milk, eggs, meat and food supplement. Incidentally, these low income consumers are known to have large families – larger than those of middle and high income consumers (Oluwatayo, 2009).

Attempting to address this gap would raise the following questions:

i. What are the socio-demographic characteristics of the consumers?
ii. What is their level of knowledge of the health benefits of fruits and vegetables?
iii. What are the principal determinants of the consumption of fruits and vegetable among the respondents?
iv. What are the constraints mitigating their propensity to consume fruits and vegetable?

The broad objective of the study is to assess the knowledge, pattern and determinants of consumption of fruits and vegetables among low income civil servant in Zaria metropolis.

The specific objectives of the study are to:

i. Describe the socio-demographic characteristics of the respondents.
ii. Assess the knowledge capacity of the respondents regarding the health benefits of fruits and vegetables.
iii. Determine the variable that influences the consumption of fruits and vegetables.
iv. Identify the constraints limiting the propensity to consume fruits and vegetables.

METHODOLOGY OF THE STUDY

This study was carried out in Zaria metropolis, the second lager town in Kaduna state after Kaduna, the state capitals. Purposive sampling was used to select three federal and one state establishment out of the several in the town.

Random sampling from a list of 6,540 staff on GL01-06 yielded 327 respondents who were interviewed using a pre-tested structured questionnaire. At the end of the exercise, 310 questionnaire were duly completed and formed the sample size for the study as shown in table 1.

Data generated were analyzed using descriptive statistics to achieve objective1, 2 and 4 while Pearson's correlation analysis was used to achieve objective 3.

Table 1: Distribution of Respondents across Sampled Establishments in Zaria Metropolis

S/N	Establishment	Questionnaire administered	Questionnaire retrieved
1	Ahmadu Bello University (ABU) Main campus	126	118
2	National Research Institute for Chemical Technical Technology (NARICT)	64	61
3	NuhuBamali Polytechnic (Main campus)	74	72
4	Nigerian College of Aviation Technology (NCAT)	63	59
	Total	**327**	**310***

Source: Survey data (2015)

NOTE: Retrieval Rate = 94.8%

RESULTS AND DISCUSSION

The results of the study are discussed under the following sub-headings:

- Socio-demographic characteristics of the respondents.
- Knowledge capacity and consumption pattern.
- Factors influencing consumption of fruits and vegetables
- Constraints limiting consumption of fruits and vegetables

Socio-demographic Characteristics of Respondents

The socio-demo graphic characteristics of the respondents are shown in table 2 covering gender, age, educational attainment, marital status, family size, religion, length of service and grade level.

Table 2: Distribution of Respondents based on Socio-demographic characteristics

s/n	Characteristics	Frequency(N=310)	Percentage (%)
i.	**Gender**		
	male	206	66.3
	female	104	33.7
ii.	**Age**		
	<25 years	41	13.2
	26-50 years	181	58.4
	>50 years	88	28.4
iii.	**Marital Status**		
	Single	78	21.5
	Married	223	72.2
	Divorced/ widowed	20	6.3
iv.	**Educational Attainments**		
	Primary	73	23.2
	Secondary	90	29.2
	Tertiary	23	7.3
	In-service/ Staff Training	125	40.3
v.	**Family size**		
	<5 persons	79	25.3
	6-10 persons	112	36.2
	>10 persons	119	38.5
vi.	**Religious Affiliation**		
	Christianity	99	31.9
	Islam	211	68.1
vii.	**Length of Service**		
	<15 years	78	25.5
	16-30 years	131	42.2
	>30 years	101	32.6
viii.	**Salary Grade Level**		
	GL01-03	145	46.8
	GL04-06	165	53.2

Source: Survey Data (2015)

The study revealed that 66.3% of the respondents were males while 33.7 were females. The mean age was found to be 38.8 years; only 13.2% of the respondents were below 25 years while about 58.4% fell in between 26 and 50 years, the proportion of the sample above 50 years was 78.4 percent.

Regarding their marital status 21.5% of the respondents were single while 72.2% were married. The remaining 6.3% were either divorced or widowed. Family size ranged from below 5 (25.3%) to more than 10 persons (38.5%). The average family size was found to be 7.8 persons.

The educational attainment of the consumers covered in this study was found to be generally low. Only 7.3% of them had attained tertiary education (Diplomas and NCE), while the majority either went through in-service/staff training (40.3%) or secondary education (29.2%). With respect to the length of service, most of them had put in reasonable length of time with the average being 21.2 years.

Knowledge/Awareness and Consumption patterns

The study sought to evaluate the respondent's knowledge of the health benefits of fruits and vegetable. Were they aware of the numerous health benefits of fruits and vegetables and if

they were aware, how much did they know and what sources informed their knowledge? Their responses are shown in table 3 as follows:

Table 3: Depth of Awareness of Health Benefits of Fruits and Vegetables

Level of awareness	Frequency (F)	Percentage (%)
Good knowledge	89	28.8
Fair knowledge	168	54.2
No knowledge	53	17.0
Total	**310**	**100**
Chi Square Statistic		62.27

Source: Survey Data(2015)

The responses in table 3 showed that 28.8% of the respondents had good knowledge of the health benefits of fruits and vegetables; 54.2% had fair knowledge while 17% had no knowledge at all. Cumulatively, therefore, about 83% of the respondents had either good or fair knowledge of the health benefits of fruits and vegetables. This can be adjudged reasonably high and corroborates the findings of Banwat *et al.,* (2012) in North Central Nigeria.

Regarding the sources of information/knowledge of the respondents about the health benefits of fruits and vegetables, their responses are shown in table 4.

Table 4: Distribution of Respondents Based on the Source(s) of Information/Knowledge

Sources of information	Frequency	Percentage (%)
Print media/books	113	22.0
Radio	137	26.7
Television	73	14.3
Parents	57	11.1
Children	80	15.5
Marketers	33	6.5
Internet/web	17	3.4
Total	**510***	**100**

Source: Survey data (2015)
Note: *= multiple responses

The result in table 4 showed that three principal sources of information were identified, namely radio (26.7%), print media/books (22%) and children (15.5%) in that order. Other prominent sources include television (14.3%) and parents (11.1%). Marketers and internet sources attracted low percentages of 6.5% and 3.4% respectively.

On the main issue of consumption, the study sought to examine the consumption pattern of fruits and vegetables among low income civil servants. In a general sense, the parameters considered were ‘regularly consume', ‘occasionally consume' and ‘rarely consume'. The responses of the respondents are show in table 5 as follows:

Table 5: Consumption Pattern of Respondents (general)

Consumption pattern	Frequency (F)	Percentage (%)
Consume regularly	74	23.9
Consume occasionally	152	49.0
Rarely consume	84	27.1
Total	**310**	**100**

Source: Survey Data, (2015)

The results in table 5 indicate that only 74 respondents (23.9%) consumed fruits and vegetables on a regular basis. About 49% consumed fruits and vegetables occasionally, while27.2% (more than a quarter) rarely consume fruits and vegetables.

For a more detailed evaluation of the consumption pattern, the study examined the pattern of consumption of specific fruits and vegetables commonly found in the study area. The responses covering five fruits and five vegetables are shown in table 6 as follows.

Table 6: Consumption Pattern for Specific Fruits and Vegetables

Item	Consumption Pattern							
	Daily		Every other day		Occasionally		Rarely	
	F	%	F	%	F	%	F	%
Fruits:								
Oranges	22	7.2	61	19.8	144	46.5	82	26.3
Mangoes	0	0	0	0	202	65.1	106	34.4
Pawpaw	0	0	10	3.1	89	28.8	211	68.0
Banana	14	4.5	66	21.2	116	37.5	114	36.8
Guava	0	0	18	5.9	158	51.0	134	43.1
Vegetables								
Spinach	53	17.0	98	31.6	147	47.5	12	3.8
Tomatoes	35	11.4	84	27.1	125	40.3	66	21.2
Lettuce	2	0.6	18	5.9	70	22.5	219	70.8
Cabbage	8	2.7	28	9.0	88	28.5	91	29.3
Pumpkin (*ugu*)	15	5.2	59	19.1	116	37.5	118	38.2

Source: Survey Data, (2015)

The figures in table 6 above revealed startling responses regarding the frequency of consumption of specific fruits and vegetables. The percentage for daily consumption ranged from 0 for mangoes, pawpaw and guava to a dismal 17% for spinach *(Amaranthus*sp.) commonly known as "green". For ‘every other day’ consumption, the percentage ranged from 0 for mangoes to 31.6% for spinach. Evidently, the seasonal availability of some of the fruits and vegetables like mangoes, may partly explain their low intake levels. But then, what about pawpaw and guava that are relatively 'all season' in terms of availability?

Conversely, the high percentage recorded for fruits and vegetables that are rarely consumed by the respondent confirm low general and specific intake levels; lettuce (70.7%), pawpaw (68.0%), guava (43.1%) and pumpkin (38.2%). These results are consistent with the findings of Ibrahim (2011) and Ndie Okaka & Okoli *et al.,* (2013) in which they observed low consumption levels in their studies in Oyo State and Southeastern Nigeria respectively.

Factors Influencing the Consumption of Fruits and Vegetables

The relationship between the socio-demographic characteristics highlighted and the consumption levels of the respondents was "determined using Pearson's Correlation Coefficient as shown in table 7 below.

Table 7: Pearson's Correlation of Socio-demographic variables influencing consumption

Variable	Correlation coefficient	Sig
Sex	.256	.003**
Age	.133	.032*
Marital status	.023	.734
Educational level	.135	.005**
Family size	.074	.004**
Religious affiliation	.020	.729
Length of service	.018	.673
Salary grade level (GL)	.057	.055**

Source: Survey data (2015)
Notes: *=Correlation significant at 0.05 levels (2-tailed)
**=Correlation is significant at 0.01 levels (2-tailed)

The correlation results in table 7 indicated that sex, educational attainment, family size and salary grade levels were significantly correlated to the consumption of fruits and vegetables by the respondents at 0.05 level of significance. Age, however was significantly correlated at 0.01 level of significance. On the other hand, marital status, religious affiliation and length of service were not significantly correlated to the consumption of fruits and vegetables by the respondents covered in the study. The determinants of fruits and vegetables consumption highlighted in the study are consistent with those identified in other studies to be influencing the consumption of fruits and vegetables including Ibrahim (2011), Ndie*et al.,* (2013) and Nwamarah & Otitoju (2014).

Constraints to Fruit and Vegetable Consumption

One of the stated objectives of the 'study was to identify the constraints limiting the consumption of fruits and vegetables by low income workers in the study area. Their responses are shown in table 8 as follows:

Table 8: Constraints Limiting the Consumption of Fruits and Vegetables

Constraints	Frequency (n-310)	Percentage	Ranking
Poor storage capacity for items	89th	9.0	6th
High cost of fruits and vegetables	182nd	18.4	3rd
Seasonal availability of some fruits and vegetables	104th	10.6	5th
Fruits and vegetables competes with stable food	196th	19.8	2nd
Poor income/salaries	219th	22.1	1st
Poor knowledge of nutritive value of fruits and vegetables	83th	8.4	7th
Large family size	116th	11.8	4th
Total	**989***	**100**	**-**

Source: Survey data (2015)
Note: * = multiple responses

From the ranking of constraints in table 8, poor income/salaries was fingered as the most limiting factor (22.1% of multiple response). This was followed by two other related constraints fruits and vegetable competing with staple foods (19.8% and the high cost of items (18.4%). Large family size ranked 4th representing 11.8% of the multiple responses of the respondents. Apparently, the respondents did not consider seasonal availability of items (5th), poor storage capacity (6th) and poor knowledge of nutritive value (7th) as very limiting constraints to their intake of fruits and vegetables. The constraints identified by the respondents are in agreement with those identified by Banwat *et al*.. (2012) and Ibrahim (2011) in their respective studies.

Worthy of note is the fact that poor knowledge of the health benefits of fruits and vegetables ranked 7th - last, again, confirming the high level of awareness of the health benefits earlier highlighted.

CONCLUSION AND RECOMMENDATIONS

The health benefits of fruits and vegetables are globally acknowledged and cannot be over-emphasized. Moreover, fruits and vegetables are considered as cheap sources of those minerals and vitamins required for healthy living. Unfortunately (as shown in this study), low income consumers who can ill afford othersources of these essential nutrients and have larger than average families, hardly consume enough fruits and vegetables. The health implication of these shortcomings obviously results in unwholesome consequence of morbidity and mortality.

This study did not go into the detailed measurement of actual quantities consumed by the respondents per given time period, but by extrapolation, it is easy to adduce that quantity consumed is a far cry from the 400g per capita per day recommended by WHO (2003).

Therefore, there is need to leverage on the high level of awareness of the health benefits of fruits and vegetables expressed by the respondents. No doubt, this will improve general consumption levels especially as it would affect infants, children and pregnant women. The following recommendations are proffered with the aim of achieving this laudable goal.

2. The need to educate and encourage proactive engagement by families not only to increase consumption of fruits and vegetables but doing so on a sustainable basis.
3. Empowering and allocating resources towards the health and nutrition of vulnerable groups infants, children and women.
4. The need for policy guidelines aimed at improving the supply and distribution of fruits and vegetables to enhance safety and quality. This is especially apt for highly perishable fruits and vegetables.
5. One way of addressing the pecuniary constraints limiting the consumption of fruits and vegetables is to encourage the ownership of personal gardens and orchard where possible.

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