

Knowledge and Intake of Fruit and Vegetables Consumption among Adults in an Urban Community in North Central Nigeria.

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ABSTRACT

Background: Fruit and vegetable consumption is an essential source of vital nutrients for the body's micronutrient requirements. However, the knowledge and intake of this essential aspect of nutrition is globally poor. This study therefore aimed at assessing the knowledge and intake of vegetables and fruits among adults in Tudun Wada Community of Jos North LGA, Central Nigeria.

Methodology: This was a cross-sectional descriptive study where 250 respondents were selected using a Multi-stage Sampling technique. Structured questionnaires were used to gather data, which were analyzed using Epi info version 3.5.1. Qualitative data are presented as frequencies and percentages while Chi-square is used to evaluate associations between outcome variables and demographic variables.

Results: There was an overall fair knowledge of the nutritional value of fruits and vegetables among majority (92.4%) the respondents, with a statistically significant association between level of education attained and knowledge ($p < 0.05$). Females were also noted to have a better practice of fruit and vegetable consumption than their male peers ($p < 0.05$). The appropriate practice of fruit and vegetable consumption was however not as high as knowledge: with only 69.2% of the respondents having appropriate consumption practices.

Conclusion: The low level of appropriate practice of fruit and vegetable consumption by adults in the study area needs to be improved by health workers using the mass media, health talks and one-on-one health education of patients and clients during health facility visits.

Key Words: Fruits, Vegetables, Knowledge, Consumption.

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INTRODUCTION

Fruit and vegetable consumption is crucial to the availability of micronutrients to the body. This is because these food items are a rich source of vitamins and minerals which are required for the normal functioning of the human body¹. Although required in small proportions, vitamins and minerals are a needed part of the daily diet as the human body is not able to synthesize them in sufficient amounts to meet the nutritionally recommended

allowances². Apart from providing micronutrients, fruits and vegetables are known to provide dietary fibers (soluble and insoluble) which are vital for the optimal functioning of the gastro-intestinal tract. They also enable the body to use other nutrients required for its normal functioning (like the energy from fats and carbohydrates)².

According to the WHO, adequate fruit and vegetable intake entails a consumption of at least 400g of fruits and vegetables per day, per capita (an equivalent of 146kg per year per capita)¹. The low consumption of fruits and vegetables globally (below the above requirement) is said to be responsible for the increased incidence of cardiovascular diseases as well as some cancers; the two leading causes of death worldwide¹. The World Health Organization (WHO) estimated that low fruit and vegetable consumptions contribute to approximately 2.7 million deaths per year from chronic diseases, 11% of cardiovascular accidents (CVA) and 31% of Ischemic Heart Diseases (IHD), worldwide¹. Low consumption of fruits and vegetables has also been ranked the sixth major risk factor for mortality in the world¹. The incidences of these chronic diseases are also increasing in developing countries, largely due to their life style and dietary changes³. The high prevalence of micronutrient deficiencies in developing countries has been attributed to the low knowledge of the nutritional value of these fruits and vegetables as well as their low consumption, despite their relative availability and cultural acceptance in these settings^{1,4}.

A study was done by the WHO to determine which developed countries had national average fruit and vegetable consumptions which were within recommended values and out of the 21 studied countries, only 3 (Israel, Spain and Italy) had acceptable national average intakes of at least 400g/day or 5 or more servings¹. It has been noted that even in developed countries, the intake of fruits and vegetables is lower among African-American than Caucasians⁵. Furthermore, both knowledge and attitude of adults to fruit and vegetable intake has been noted globally to be below nutritionally recommended and acceptable limits^{6,7}. The picture in developing countries is not much different; adult intake of fruits and vegetables is low, but is dependent on income and individuals' perception of the importance of these food items to adequate nutrition^{1,8,9}.

In recent years, there has been an increase in the number of fruit stands in the vicinity of the study area, the inhabitants of which are known to both grow and trade in both fruits and vegetables. These food items (particularly fruits) are also known to be bought for children and wards as snacks

by many adults. This study therefore aimed at assessing their knowledge of the nutritional value of these food items. It set out as well to assess the consumption of vegetables and fruits among adults in Tudun Wada, an urban-slum Community of Jos North local Government Area (LGA) of Plateau State, Nigeria.

METHODOLOGY

Study Area: Tudun Wada Community is an urban-slum area situated within the cosmopolitan area of Jos, the Plateau State capital. It forms a political ward, in Jos North LGA of the state with an estimated population of 70,000 people¹⁰. The area is famous for its tourist potentials as it houses a wild life games reserve and recreational facilities like an amusement park and the Mado Tourist Village with rocky terrain and its cold climate. Government owned facilities/structures in the area include the Federal Secretariat, The Governor's office, Police stations, a Primary Health Care facility and Primary school. Most of its inhabitants are of the middle and low social class, engaged majorly in trading and skilled labor (Artisan) activities.

Study Design

This was a cross-sectional descriptive study.

STUDY POPULATION: Consisted of all adults (aged 18 years and above) residing in the study area at the time of the study. Those studied needed to have resided in the area for at least 3 months; excluding visitors and migrants.

Sample Size Determination

A minimum sample size was determined using the formula:

$$N = \frac{Z^2 pq}{d^2}$$

Where N = minimum sample size

Z = Standard deviation score at 95% = 1.96

P = Knowledge and practice in Nigerian adult population = 81%⁽⁴⁾ = 0.81

Q = Complimentary Probability (1-P) = 1 - 0.81 = 0.19

d = Error Margin = 5% = 0.05

Substituting: $N = \frac{(1.96)^2 \times 0.81 \times 0.19}{(0.05)^2} = 236$

A minimum sample size of 236 study subjects was calculated. For the study, 250 consenting adults were selected.

SAMPLING TECHNIQUE: A multistage sampling technique was used to select study subjects;

Stage 1: Jos North LGA was selected from a sampling frame made of the list of the 17 LGA in Plateau State, by simple random sampling by balloting.

Stage 2: Tudun Wada ward was selected from a list of the 18 political wards in Jos North LGA using Simple random sampling by balloting.

Stage 3: Tudun Wada ward was then stratified into two: one stratum inhabited by individuals of high social class from which 50 adults were selected, the other stratum was made of 200 individuals of the middle and low social classes. Systematic sampling technique was used to select the study subjects: In the high social class residential area, a sampling interval of 5 was used (the minimum sample size of 250 divided by the population of 50 adults) and two consenting adults in every fifth house were enrolled into the study. In the middle and low social class residential areas, one adult in every other house was enrolled in to the study (sampling

interval was $250/200 = 1.5$ rounded up to 2)

Instruments For Data Collection

Data was collected using interviewer administered questionnaires consisting of structured questions relating to the individual's socio-demographic data, knowledge of the nutritional importance of fruits and vegetables and regarding actual consumption practices of the respondents.

Data Analysis

All data generated was collated and analyzed using EPI info statistical software, version 3.5.1(2008). Knowledge was graded as good, fair or poor based on the number of correct answers respondents gave to the nine (9) questions asked to assess knowledge: a score of 0-3 was graded poor knowledge, 4-6 fair and 7-9 good knowledge. Practice (consumption of fruits and vegetables) was compared to the recommended daily intake of 5 servings a day and assessed to be either appropriate or not appropriate for each individual. Quantitative data were presented using, mean and standard deviation while Chi-square was used to test for relationship between socio-demographics and nutritional findings.

Written permission for the study was gotten from the department of Community Medicine JUTH (as the study was part of medical student survey while on posting in the department), while advocacy visits were paid to the village head of Tudun Wada and informed verbal consent was gotten from each subject before being recruited into the study.

Limitations Of The Study

Since the subjects had to recall from memory their intake of fruits and vegetables in the past 24 hours, this leaves room for recall bias as the memory of some respondents may be better than some others.

RESULTS

More of the studied subjects were male (54.4%) and of the age group 18-29 years (62.4%); the mean age of the respondents was 28.65 ± 12.8 years and a good number had attained secondary (46.4%) or tertiary education (42.0%) (Table 1). Findings from the study revealed that majority of the respondents (92.4%) had a fair knowledge of the nutritional value of fruits and vegetables; with a statistically significant association between sex and knowledge (Table II) as well as between level of education attained and knowledge (Table III). Females were also noted to have a better practice of fruit and vegetable consumption than their male peers (Table IV). The appropriate practice of fruit and vegetable consumption was however not as high as knowledge: with only 69.2% of the respondents having appropriate

Table I: Socio-demographic data of the Subjects

Variable	Frequency (N = 250)	Percentage
Age (Years)		
18- 29	156	62.4
30-39	67	26.8
40-49	20	8.0
50-59	3	1.2
≥60	4	1.6
Sex		
Females	114	45.6
Males	136	54.4
Highest education Level attained		
None	17	6.8
Primary	13	5.2
Secondary	113	45.2
Tertiary	107	42.8

Table II: Relationship between Knowledge and Sex of Respondents

Sex	Poor		Fair		Good		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
Male	13	81.3	123	53.2	0	0	136	54.4
Female	3	18.7	108	46.8	3	100.0	116	46.4
Total	16	100	231	100	3	100	250	100

$\chi^2 = 139.01$; $df = 3$; $P = 0.0006$

Table III: Relationship between Knowledge and level of Education of Respondents

Level of Education	Poor		Fair		Good		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
None	2	12.5	15	6.5	0	0	17	6.8
Primary	1	6.3	12	5.2	0	0	13	5.2
Secondary	6	37.5	106	45.9	1	33.3	113	45.2
Tertiary	7	43.7	98	42.4	2	66.7	107	42.8
Total	16	100	231	100	3	100	260	100

$\chi^2 = 13.31$; $df = 6$; $P = 0.0384$

Table IV: Relationship between Practice and Sex of respondents

Sex	Appropriate		Inappropriate		Total	
	Freq	%	Freq	%	Freq	%
Male	83	48.0	53	68.8	136	54.4
Female	90	52.0	24	31.2	114	55.6
Total	173	100	77	100	250	100

$\chi^2 = 11.46$; $df = 2$; $P = 0.0032$

Table V: Deterrents of Fruit and Vegetable Consumption (Multiple answers allowed)

Deterrent	Frequency (N = 250)	Percentage
Cost	241	96.2
Geographical access	161	64.4
Seasonality	222	88.8
Unsure of source	124	49.6

consumption practices (Table IV). The major factors noted to limit vegetable and fruit intake included being unsure of the source of the food items (88.0%) and availability of the food items (96.2%) (Table V).

DISCUSSION

Majority of the respondents (92.4%) had a fair knowledge of the nutritional value of fruits and vegetables, with only 1.2% having a good knowledge of their nutritional value. This level of knowledge was much lower than that assessed by Bettana et al¹¹, who found out that 39% of his studied population had a good knowledge of the nutritional value of fruits and vegetables. The lower finding in this study could be related to a lower educational status in Tudun Wada population as well as the studied population/area being made up of middle and lower social class individuals unlike Bettana's study population with a higher social class. Unlike this study which is community based, the Bettana study was done among college students who are more likely to be better educated and knowledgeable than this study's population.

Knowledge of the nutritional value of fruits and vegetables was found to be statistically associated with sex of the respondents, with female having higher knowledge than their female peers. This can be explained by the fact that females are more likely to be taught (at home, in the neighborhood and in school) about this nutritional value of food items than their male peers¹². It was also noted that knowledge of respondents has a statistically significant association with their highest level of education attained ($P < 0.05$). A similar finding was reported by Ruel, M.T and her colleagues who explained this association by the close link between education and availability of and access to nutrition related information through the mass media and from educational literature¹.

In 69.2% of respondents, the practice of consumption of fruits and vegetables was appropriate (within the recommended allowances). This high proportion of adequate practice is different from findings in other developing countries^{1,13} where the practice was found to be as low as 40%¹. The higher finding in this study can be related to the fact that the diet of most indigenous tribes in Plateau state consists of leafy vegetables and vegetables like tomatoes, onions and pepper are essential ingredients in the diet of most Nigerians. Most houses in the study area are also built in a way as to accommodate home gardens where these vital home cooking ingredients are grown in small quantities that can at least meet the family needs. The cool weather of Plateau State also enables a great variety of fruits and vegetables to be grown and stored all year round, making them available in the market. The limiting factor is usually cost and being unsure of its source¹⁴. However, this proportion is much less than that for knowledge (which was fair in about 92.4% of respondents) and shows that knowledge alone cannot ensure adequate practice of a health activity.

Factors noted in this study to affect fruit and vegetable consumption majorly included cost of the food item and seasonal availability of the items (Table V). Other researchers have also found these to be the two main deterrents mentioned by study subjects to limit adequate consumption¹. However, other studies show that despite being in season (and therefore being cheap and available), many adults still do not

consume adequate portions of fruits and vegetables⁴.

CONCLUSION

It was concluded from this study that the knowledge of the nutritional value of fruits and vegetables is high (92.4% having a fair knowledge) but the consumption of these food items is low (69.2%). Reasons for this lower proportion of practice as compared to knowledge are majorly cost of food items and seasonal availability. The lower level of appropriate practice of fruit and vegetable consumption by adults in the study area needs to be improved by health workers using the mass media, health talks and one-on-one health education of patients and clients during health facility visits. Families need to be encouraged to have small gardens in their houses to ensure availability of fruits and vegetables for home consumption all year round.

REFERENCES

1. Ruel MT, Nicholas M, Lisa S. Patterns and determinants of fruit and vegetable consumption in Sub-Saharan Africa. FAO/WHO workshop on fruits and vegetables for health, 1st 3rd September 2004. Japan. [Online] Available at www.who.int/en/. Accessed 21/5/2011.
2. Park S. Nutrition and Health; In: Park's textbook of preventive and social medicine. 18th edition, Bhanot Publishers, India 2005:442-452.
3. Hill, MD. Recall fruit and vegetable intake while growing up and its association with adult fruit and vegetable intake among United States adults. [Online] Available at digitalarchives.gsu.edu/cgi/viewcontent. Accessed 21/5/2011.
4. Hart, AD., Azubuike, CU., Barimala, SC. Vegetable consumption patterns of households in selected areas of the old Rivers state of Nigeria. African Journal of Food Agriculture, Nutrition and Development. 2005; 5(1):<http://www.ajfand.net/Volume5/No1/index1.html> Accessed 23/5/2011.
5. McClelland JW, Demark-Wahnefried W, Mustian RD, Cowan AT, Campbell MK. Fruit and vegetable consumption of rural African-Americans; Baseline survey results of Black Churches United for Better Health. *Nutr Cancer*.1998; 30(2):148-57.
6. United States Center for Disease Control (CDC), Morbidity and Mortality, Weekly Report (MMWR) State specific Trends in Fruit and Vegetable Consumption, United States, 2000-2009. *MMWR* 2011; 59(35):1125-1130.
7. Sheikh, AR. Psychosocial predictors of fruit and vegetable consumption in adults: a review of the Literature. *American Journal of Preventive Medicine*.2006; 6(34):535-543.
8. Ibrahim, FM. Fruity response efficacy and fruit consumption among a group of civil servants in Oyo state, Nigeria. *American Journal of Food and Nutrition*. *AJFN* 2011;1(1):44-48.
9. Ruta, FS. Knowledge, beliefs and practices related to the consumption of Fruits and vegetables in Samoa. A FAO sub-regional office for the Pacific Islands Research Report. [Online] Available at www.faopacific.ws/portals/167. Accessed 20/5/2011.
10. National Population Commission (NPC) [Nigeria] and ICF Macro. 2009. Nigeria Demographic and Health Survey 2008. Abuja, Nigeria: National Population Commission and ICF Macro. P10-60
11. Bettina, MB., Rochelle, R. and Leam, M. Knowledge, attitude and practices related to fruit and vegetable consumption of high school students. [Online] Available at www.linkighub.elsevier.com Accessed 19/5/2011.
12. Baker, A. & Wardle, J. Sex differences in fruit and vegetable intake in older adults. *Science Direct*, 2003; 40(3):269-275.
13. Gary, J. Current status of fruit and vegetable production and consumption in Francophone African countries: Potential impact on health. *Proceedings of International*