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Knowledge of the Nutritional and Medicinal Use of Some Vegetables among a Cross Section of Market Women in Two Major Food Markets in Lagos State, South West Nigeria

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Abstract: The knowledge of the nutritional and medicinal benefits of some vegetables found around the south west-Nigeria was tested among cross section of market women in Lagos state Nigeria, using questionnaires and coloured pictures of seventeen of these vegetables. This study was carried out in Lagos state which houses a cross section of the nation ethnic groups and also serves as the commercial nerve centre of Nigeria. One thousand market women with varying level of education were selected and tested on proper identification and their knowledge on nutritional and medicinal benefits of seventeen vegetables found around them. Sociodemographic data such as age, educational status were also recorded. The results revealed high percentage school dropout among the market women. There is also a level of ignorance about the available vegetables around among the market women thou there seems to be a good appreciation of their medicinal values. Considering the capital base of these women especially the largest age bracket of 21-45 years, we suggested that financially empowering them will reduce the vicious circle of poverty associated with school dropout among girls in Nigeria. The populace need to be educated about the readily available vegetables around them to reducing the incidence of macronutrient deficiencies.

Key words: Vegetable, knowledge, medicinal plants, girls education

INTRODUCTION

The vegetation of the south western Nigeria being in the rainforest is very rich in fruits and leafy vegetables. A closer look at the vegetable content of the diet in this geographical area of Nigeria however, revealed that very few vegetables are routinely included in the diet compared to the abundance of vegetables in the area. This can be attributed to the inadequate knowledge of dietary and medicinal use of some of these plants. This knowledge varies from place to place. While the knowledge of the nutritive benefits of some vegetables are general to all communities there are also strong discrimination about dietary and nutritional values of several other vegetables in different communities due to cultural background. This has greatly affected the cultivation, preservation and utilization of many vegetables that are found in abundance around us. In the light of the global food crisis, this phenomenon has also reduced the available nutritional sources of such communities, making it a situation of suffering in the midst of plenty or malnutrition in the midst of abundant food source.

The joint FAO/WHO (2004) report on a Global Strategy on Diet, Physical Activity and Health, recommended a minimum daily intake of 400 g of fruits and vegetables. At the 2004 joint Kobe workshop, WHO and FAO also developed a framework that proposes ways to promote

increased production, availability and access and adequate consumption of fruits and vegetables. In addition, there has been an increased awareness of the health protecting properties of non-nutrient bio-active compounds found in fruits and vegetables and this has directed immense attention to vegetables as vital components of daily diets. The effect is global reorientation and a gradual shift towards the consumption of vegetables and herbs. More people are getting aware of the benefits of consumption of vegetable such as the Cruciferous vegetables (Cabbage and Mustard) on prevention of prostate cancer (Genoveva and Rajendra, 2001). The reported high antioxidant activities of vegetables also help in protecting cell membrane integrity and reducing rate of aging (Cook *et al.*, 1998). In this study, we tried to determine the extent of the knowledge of a cross section of market women in Lagos state on the various vegetables available around their locality as well as the knowledge about nutritional and medicinal values of these vegetables.

There has been several attempt and concerted efforts by both individual researchers and International organizations towards combating the problem of malnutrition, hunger and food scarcity by a way of reorientation of the populace on the available nutritional vegetables around them (Fleuret, 1979; Nordeide *et al.*,

1996; Sena *et al.*, 1998; Jansen *et al.*, 2004). Researchers have tried to enumerate and emphasized several vegetables whose nutritional values were not previously appreciated and so not eaten in such a way that the populace can start including them in their diet as well as making some economic gain from their cultivation. In a research conducted in Bangladesh by Hellen Keller International Foundation it was discovered that teaching women and men about the nutritional value of certain foods, such as green leafy vegetables and encouraging them to grow and eat these is an effective way of improving nutrition and preventing micronutrient deficiencies (Helen Keller International (HKI)/AVRDC, 1993).

Vegetables are known to be the cheapest source of Vitamins especially the water soluble vitamins and micro nutrients. To this effect, there has been advocacy for extension of nutrition education to different groups in rural area in Nigeria taking into consideration local custom, food production pattern, post-harvest handling of agricultural produce and extent of malnutrition and the dietary needs of different age groups (Sylvester *et al.*, 1991). A regional workshop at the African Institute for Capacity Development, Juja, Nairobi, in December 6-9, 2005 focused extensively on developing African leafy vegetables for improved nutrition. Other authors in the field of Agriculture, Food Biochemistry and Nutrition have tried to highlight the beneficial and nutritional values of some of the vegetables with the view to encouraging cultivation and consumption of such vegetables in different parts of Africa (Eggum, 1970; Muhammad and Amusa, 2005; Richard *et al.*, 2007; Voster *et al.*, 2007). Others have described the medicinal benefits derivable from some of these vegetables. The list of such beneficial effects that identified with the major health problems peculiar to Africa and different localities is inexhaustible.

MATERIALS AND METHODS

Questionnaires were administered to collect data from the market. A pilot study was first carried out to test the questionnaire and also to perfect areas of ambiguity. This market was randomly picked out of the markets in Lagos state. A total of eighty (80) questionnaires was administered by trained Interviewers who have previously been briefed about the aim and objectives of the study. Our target interviewees were selected using our predetermined inclusive and exclusive criteria. The criteria are:

- Any woman who has been selling in the market for more than 12 months
- Any woman that sells unprocessed food stuff or herbs in the market.

The exclusion criteria are:

- Any woman that has not been selling in the market for the past 12 months

- Any woman that does not sell unprocessed food stuff or herbs.

Women were chosen as our target audience because they were directly involved with planning of meal for the home as well as preparing the various dishes in which these vegetables are used. The result of the pilot study was used to fine tune the questionnaire for the full study. There are two groups of questions in the questionnaire designed to take care of sociodemographic patterns as well as knowledge and attitude of our target population on the nutritional and medicinal values of some of the available vegetables around them. The first group of questions which are five in number took care of the sociodemographic patterns which are the age bracket, level of educational attainment, marital status, religion affiliation, type of wares sold in the market. The second group of questions which were twelve in number involved identification of the vegetable plants from the pictures as well as the knowledge of the medicinal use of the plants in treatment of some common diseases and disorders such as fever, diarrhoea, rashes, cold, sexually transmitted infections, anaemia, epilepsy, infertility, high blood pressure, diabetes mellitus and ulcer. Questions on identification require giving the local name of the plant which interviewers will check out with the correct local name(s) on their records. Other questions on medicinal use of the plants require either yes or no while sociodemographic questions requires specific answer from the interviewee.

The second phase was the main study. A thousand questionnaires (3000) were administered to our focused audience at Ojuwoye market in Mushin local government area and Mile 12 market at Kosofe local government area of Lagos state. The questionnaires were administered by trained interviewers who have been properly briefed about the study. Rough maps of the markets were drawn with the aid of the Interviewer and the two markets were divided into six areas prior to the administration of the questionnaire to prevent overlap in the administration. The questionnaires were administered for 4 weeks.

This research work does not require any institutional review board approval.

Data collected were analyzed using SPSS version 11 and presented as percentage response. Histogram and pie chart were also used for graphical presentation.

A total number of seventeen vegetable plants that were randomly selected from a total number of fifty vegetable plants were used in this study. Sharp clear and coloured pictures of the vegetables (A4 size) were taken, printed and laminated to make them more durable. The pictures were given only numbers that corresponds to names that were only known by the Interviewers. The following vegetables were used (Table 1). The leaves and the stems of all plants are consumed locally except for *Xylopiya Acthiopica* (erunje eeru) where the fruit is the edible portion.

Table 1: Botanical name (common name); % correctly identified; % knowledge of nutritional values of some vegetables among a cross section of some market women in Lagos state, south west Nigeria

Botanical Name of Vegetable	Part used in this study	Vernacular names (Yoruba)	Identification (%)		Response on nutritional value %	
			Correct	Incorrect	Edible and nutritious	Not edible/No knowledge/ Ignorance
<i>Piper Guineese</i>	Seed	Iyere	61.4	38.6	61.4	38.6
<i>Psidium Guajava</i>	Plant leaves and stem	Guava	42.6	57.4	42.6	57.4
<i>Allium sativum</i>	Bulb	Ayuu	93.1	6.9	93.1	6.9
<i>Celosia Argentea</i>	Plant leaves and stem	Efo Sokoyokoto	57.4	42.6	57.4	42.6
<i>Cucurbita pepo</i>	Plant leaves and stem	Elegede	48.5	51.5	48.5	51.5
<i>Hibiscus Sabdarifa</i>	Plant leaves and stem	Sobo	5.0	95.0	5.0	95.0
<i>Manihot Esculenta</i>	Plant leaves and stem	Ege/Gbaguda	63.4	36.6	63.4	36.6
<i>Ocimum Basilicum</i>	Plant leaves and stem	Efrin	41.6	58.4	41.6	58.4
<i>Telfaria Occidentalis</i>	Plant leaves and stem	Ugwu	63.4	36.6	63.4	36.6
<i>Xanthosoma Mafaffa</i>	Plant leaves and stem	Koko	86.1	13.9	86.1	13.9
<i>Solanum Macrocarpon</i>	Plant leaves and stem	Efo Igbo	59.4	40.6	59.4	40.6
<i>Talinum Triangulare</i>	Plant leaves and stem	Efo Gbure	87.1	12.9	87.1	12.9
<i>Lactuca capensis</i>	Plant leaves and stem	Iyanje oko	1.0	99.0	1.0	99.0
<i>Lycopersicon Esculentum</i>	Plant leaves and stem	Tomati	55.4	44.6	55.4	44.6
<i>Cnidioscolus Asconitifolius</i>	Plant leaves and stem	Efo Iyana Ipaja	19.8	80.2	19.8	80.2
<i>Corchorus Olorus</i>	Plant leaves and stem	Ewedu/Ayoo	72.3	27.7	72.3	27.7
<i>Xylophia Acthiopica</i>	Fruit	Erunje eeru	86.1	13.9	86.1	13.9

RESULTS

Eleven out of the seventeen vegetables in this study have above 50% correct identification mark with *Lactuca capensis* being the least recognized (1.0%) followed by *Hibiscus Sabdarifa* (5.0%). This calls for the need to educate the people about the available vegetable around them. Interestingly, *Hibiscus sabdarifa* (sobo), the petals of which are used for the nutritious sobo drink commonly found in Nigeria had 5.0% correct identification. This is a typical example of how some part of a vegetable can be known while other parts that are equally nutritious and useful are not known. There was good sense of appreciation of those vegetables that were properly identified. The results of the appreciation of the medicinal use of the plants showed that the market women have knowledge of the medicinal values of several of the vegetables used in this study. The vegetable with the largest percentage use for fever was *Psidium guajava* (27.0%) and *Corchorus olitorius* (25.7%) while for diarrhoea it was *Piper guineese* (100%). *Allium sativa* has the highest for lowering blood pressure (53.5%). For anaemia it was *Telfaria occidentalis* (49.5%) while *xylophia acthiopica* has the highest percentage (41.6%) for treating rashes. Most of the women responded that the vegetables are not used for treating diabetes mellitus.

Majority of the women fell between the age brackets of 21-45 which happens to be the productive age. Investing into their life during this period will be a good way to reduce poverty and reduce the vicious circle of girls drop out from school. Also the largest population of the women happened to be Muslim followed by Christians the two major.

Majority of the market women were only able to the level of secondary school education before they retire to trading. This might not be unconnected to poverty level

Table 2: Age bracket of the cross section of market women from Lagos state, south west Nigeria, that were interviewed in this study as well as their religious affiliations

Age of the market women		Religious affiliation of the market women	
Age bracket	Frequency	Status	Frequency
15-20	2.0	Christianity	36.0
21-25	4.0	Islam	60.0
26-30	14.0	Traditional religion	4.0
31-35	19.0	Others	0.0
36-40	16.0		
41-45	11.0		
46-50	9.0		
51-55	10.0		
56-60	6.0		
61-65	5.0		
66-70	1.0		
>70	5.0		

in the society as well as the cultural believe about the place of women in the society. The largest percentages of these women were involved in the sales of perishable foods which include vegetables. The capital base for such business is low and the risk is high due to lack of storage facility.

DISCUSSION

In the face of the global food crisis all hands must be on deck to ensure that relief is brought to as many that have been affected. These come inform of food aids, agricultural loans and sub cede. However, the long term remedies will not only be in the encouragement of modern commercial agriculture but also in an inward search into the available nutritional food crops and vegetable in each community. This will go a long way in utilization of the available recourses in achieving far reaching benefits for the communities.

Table 3: Level of formal education attained as well as the type of wares sold in the market by cross section of the market women from Lagos, south west Nigeria that were interviewed in this study

Level of formal education		Types of wares sold in the market	
Level	Frequency	Wares	Frequency
Nil/No formal education	19.0	Perishable foods	50.5
Primary School Uncompleted	7.4	Non perishable foods	26.8
Primary School Completed	22.3	Herbs	19.6
Secondary School Uncompleted	16.0	Others	3.1
Secondary School Completed	29.0		
Tertiary Institution Uncompleted	1.1		
Tertiary Institution Completed	4.3		

The disparity between the abundance of vegetable around compared to the number been included in our daily diet has led to the concept of Neglected Underutilized Specie (NUS). Bioversity International (formerly IPGRI) defines these species as neglected and underutilized plant species, not crops, since wild, managed and cultivated species are taken into consideration. These plant species may belong to any category, from fruit and nut trees to leafy vegetables, from functional herbs (or medicinal and aromatic plants (MAPs)) to cereals, from legumes to forest trees, from forages to roots and tubers. The importance of NUS is that they require only limited external inputs for production, they grow well on poor soil and also offer multiple uses ranging from nutrition to medicinal (Alessandra Giuliani, 2007). Mohammad and Amusa (2005) highlighted the important food crops of the northwest Nigeria among which are a lot of fruits and vegetables. As far back as 1970, Eggum had documented the protein content of some vegetable leaves from Nigeria among which is cassava and had proven that the protein content ranges from 30-40% with digestibility that ranges from 70-80% (Eggum, 1970). Taiga *et al.* (2008) reported that *Telfairia. Occidentalis* contains 13.33% protein and 63.64% Carbohydrate. They also reported the carbohydrate content of *Piper guineese* to be 77.17%. It has been well argued that edible wild plants play a major role in augmenting the macronutrient requirements of people all over the world and that they account for over 80% of the leafy vegetables consumed all over the world (Grivette and Ogle, 2000).

The results of the demographic pattern from this study showed that there have been problems with girls' education in Lagos state in the past. This was made evident by the results of the number of drop out both at the primary school level and Secondary school level which was 7.4% and 16% respectively. This result corroborates the 30% result given recently by UNICEF on the number of drop out among girls at primary and secondary school level in Nigeria (UNICEF, 2002). This may not be unconnected with poverty level which was placed at 70% (Percentage of people living below poverty line), Teenage pregnancy, early marriage as well

as cultural and religious bias (UNICEF, 2002). Until recently, the place of women in Nation building was relegated to the background due to cultural and religious bias. Women's place was said to be in the kitchen and at home raising children. In addition, the imbalance in the appointment of women into top Government positions as well as in top private establishment made mentorships and motivation of girls' education a difficult task. The ages of most of the women interviewed in the market were between 21-45 years which accounted for 64% of total number of women interviewed. This happens to be the productive age beyond which most workers retire to a less strenuous activity. The percentage of the women that were above 45 years of age was 33% with majority falling between 56-60 years of age. Considering the asset base of this set of women, one tends to imagine how and when the vicious circle of the problem with girl's education will stop. Therefore, we are suggesting that these women can be empowered financially by making available soft loans which will go a long way in reducing the poverty level that has been one of the causes of increase in girls drop out from schools.

The results of the identification of the vegetable plants showed that eleven out of the seventeen vegetables have correct identification above 50% among the population studied. That is not to conclude that our audience have no knowledge of the vegetables at all but the parts specified may not be known. To emphasize this, it will be surprising to know for example that while the audience were able to recognize the petals of *Hibiscus sabdariffa* (Zobo) only 5% were able to correctly identify the plant itself which is a good vegetable. This buttress the need to educate the populace about the available nutritious vegetables around them so that they can be included in the daily diet. Nigeria is blessed with vas vegetation with abundance of edible but undiscovered vegetable plants. Even those that were discovered were grossly underutilized due to poor knowledge of their nutritional benefits and religious and tradition bias. It was reported by Maziya-Dixon *et al.* (2004) that leafy vegetables in Nigeria are relatively available and affordable particularly during the rainy seasons but were found to be among the least

consumed foods. The least correctly identified vegetable out of the seventeen vegetables used in this study was *Lactuca carpendis* (lyarin oko).

From the response to the medicinal importance of these vegetables, it was evident that the medicinal values of majority of these medicinal plants are locally appreciated. For the treatment of fever *Psidium guajava* leaf was scored highest (27.7%) followed by *Corchorus olitorus* (25.7%) and then *Piper guineense* (10.9%). For the treatment of rashes *Xylopia Aethiopica* ranked highest (41.6%), followed by *Cucubita pepo* (17.8%). For the treatment of sexually transmitted infections *Cucubita pepo* was the only suggested vegetable with percentage yes response of (6.7%). For the treatment of anaemic condition, *Telfaira occidentalis* ranked highest (49.5%), followed by *Celosia argentea* (14.9%) and *Talinium triangulare* (13.9%). As contraceptive, *Piper guineense* was the only one with highest yes response of 6.9%. *Allium sativum* ranked highest with 53.5% in treatment of high blood pressure. For the treatment of Ulcerative colitis *Telfaria occidentalis* ranked highest with percentage yes response of 9.9%, followed by *Allium sativum* (4.0%).

Some of the acclaimed medicinal uses of these vegetables in folk law medicine have been investigated to ascertain their beneficial and detrimental effects. Ajayi *et al.* (2000) reported that two weeks oral administration of water extract of *Telfaira occidentalis* to Rabbits increased their haematocrit and red blood cell count. We have earlier reported also that administration of methanol seed extract of *Piper guineense* for 28 days to female rats adversely affected several female reproductive parameters including hormonal profile, oestrus cycle pattern and ovulation. In addition, we have also reported the reversible deleterious effects of Aqueous Extract of *Spondias mombin* bark and methanol fruit extract of *Abelmoschus esculentus* leaf (okra) on male reproduction (Raji *et al.*, 2006; Olatunji-Bello *et al.*, 2007a) and also the disruption of estrus cycle pattern in rats administered aqueous leaf extract of *Magnifera indica* (mango leaf) (Olatunji-Bello *et al.*, 2007b). These are some of the reportedly consumed vegetables for such benefits as contraceptives in male and females.

Conclusion: The results of the present study has revealed that there is need for public education on the available vegetables around us which can serve as herbal medicine, sources of nutrients and micro nutrients that may salvage the population from the incidence of malnutrition. In addition the results highlighted the fact that urgent attention still needs to be directed towards girls' education in Nigeria. It also pointed out the need to financially empower the market women whose capital base are small to eradicate poverty that has been the major cause of increased number of girls that drop out from school.

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