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Promoting Consumption of Fruits and Vegetables among Senior Secondary School Students in Delta State, Nigeria

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Abstract

Way of promoting consumption of fruits and vegetables among Senior Secondary School (SSS) students in Delta State, Nigeria were investigated in this study. Three research questions and three null hypotheses guided the study. The study adopted descriptive survey research design. The population for the study was 46,286 SS II students in the Delta State. Questionnaire was the instrument for collection data. Mean and t-test were used for the analysis of data. Findings include seven reasons for consumption of fruits and vegetables among students. These include, they are source of minerals and Vitamins (3.42), I heard about their nutritional benefits and others. There are eight hindrances for consumption of fruits and vegetables among students. These include; availability of desired fruits and vegetables within my local (; high cost of fruits and vegetables in the market (among others. Other findings are 10 ways of improving fruits and vegetables consumption practices among students. These include; increasing the rate fruits and vegetables consumption (; increased Nutrition Education to students on the importance of fruits and vegetables choices (3.65) and others. t-t results revealed no significant ($p<0.05$) differences between mean ratings of the responses of urban and rural students on their major reasons for consumption of fruits and vegetables and hindrances for fruits and vegetables consumption. There was significant ($p<0.05$) difference between the mean responses on the ways of improving fruits and vegetables consumption based on gender. Based on the findings, the study recommended increased Nutrition Education to secondary school students for better knowledge of the importance of fruits and vegetables consumption.

Keywords: Strategies, Consumption, Secondary, School, Fruits, Vegetables, Students.

Introduction

An important part of a healthy human's diet is the consumption of fruits and vegetables (Layade & Adeoye (2014). This is because, they are good sources of vitamins and minerals, vegetable proteins, protective micronutrients and dietary fibre that help prevent constipation (Balasubramanian & Ragunathan, 2012). It is a low-energy diet, that is, low-calorie with respect to the volume of the diet, which allows for

the maintenance of a healthy weight (United States Department of Agriculture (USDA, 2009). Obisesan (2019) argued that fruits and vegetables are low-fat diets as they are good sources of vitamins. Nwamarah and Otitoju (2014) added that heavy intake of fruits and vegetables radically reduces the chances of developing many chronic diseases such as stroke, heart disease, metabolic syndrome and cancer. Despite the importance of fruits and vegetables, Hall, Moore and Lynch (2009) stated that their consumption per person in Africa is relatively low between 70 and 312g per day compared to WHO/FAO recommendation per person of eating 400g per day.

The World Health Organization's data sheet of 2013 shows an estimated 2.7 million deaths and 1.8 percent of the world's disease burden are due to poor consumption of fruits and vegetables. Inadequate eating of fruits and vegetables is estimated to approximately cause 14 percent of all deaths from stomach cancer, approximately 31 percent of heart disease and 11 percent of stroke {World Health Organization, (WHO)2003}. The challenge of eating nutritious food is common all over the world. More than 800 million people around the globe are malnourished; majority of them living in developing countries {Food and Agriculture Organization, (FAO) 2017}. Poor diet pattern and inadequate intake of fruits and vegetables among students contribute to major risk factors for micronutrients deficiency, obesity, heart disease, cancer, and other non-communicable diseases such as diabetes, high cholesterol and high blood pressure among students in secondary school.

There are common factors which influence students' fruits and vegetables consumption. These include, among others gender (male and female) and student environment (rural or urban). Gender, as pointed out by the WHO (2001) refers to the economic, social and cultural factors and the opportunities associated with being a man or a woman. According to Owoeye and Yara (2011), school location could urban or rural and this influences availability of fruits and vegetables, as well as their consumption. Other factors that could hinder or influence students' consumption of fruits and vegetables are accessibility, students' food related knowledge, their food likes and dislikes. Since it is necessary that they must take these food items for good health, it becomes important to evolve ways of improving the students' consumption of fruits and vegetables. This is a gap which this study tried to fill up.

Purpose of the Study

The broad purpose of the study was to examine ways of promoting consumption of fruits and vegetables by Senior Secondary School (SSS) students in Delta State, Nigeria. Specifically, the study determined:

1. reasons for fruits and vegetables consumption among urban and rural SSS students in Delta State.
2. hindrances to urban and rural SSS students' consumption of fruits and vegetables in Delta State.
3. ways of improving fruits and vegetables consumption practices among male and female SSS students in Delta State.

Research Questions

1. What are the reasons for fruits and vegetables consumption among urban and rural SSS students in Delta State?
2. What are the hindrances to urban and rural SSS students' consumption of fruits and vegetables in Delta State?
3. What are the ways of improving fruits and vegetables consumption practices among male and female SSS students in Delta State.

Hypotheses (HOs)

The following hypotheses (HO) were tested at 0.05 level of significance.

Ho_1: There is no significant difference in the mean responses of urban and rural SSS students on their reasons for fruits and vegetables consumption in Delta State.

Ho_2: There is no significant difference in the mean responses of urban and rural Senior SSS students on their hindrances to consumption of fruits and vegetables in Delta State.

Ho_3: There is no significant difference in the mean responses of male and female SSS students on ways of improving fruits and vegetables consumption practices in Delta State.

Methodology

***Design of the Study*:** The descriptive research design was adopted for the study.

***Area of the Study*:** The study was conducted Delta State which is made up of 25 Local Government Areas (LGAs) with reported population of 4,825,999 by the National Bureau of Statistics (2012). Delta State is located within the South-South geopolitical region of the country divided into three senatorial districts: Delta North, Delta Central and Delta South senatorial districts. The state is educationally endowed with several Universities, Colleges of Education, Polytechnics, Technical Colleges and outstanding secondary schools. There are 471 government-owned Secondary Schools (Delta State Ministry of Basic and Secondary Education, 2019).

***Population for the Study*:** The study population was 46,286 SSS II students consisting of 22,719 males and 23,567 female students from the 471 government operated secondary schools. The average age of SSS II students is 15 years for all schools across the state. The study focused on SSS II students because they are penultimate year and have been exposed to enough instruction on Nutrition education. In addition, they were not preparing for WAEC and were very much available to respond to the questionnaire.

***Sample for the Study*:** A sample of 384 students was used in the study. Two local government areas (LGAs) were randomly selected from each of the three senatorial zones in the state, to give six LGAs. Three coeducational (boys and girls) public schools were purposively selected from each of the six LGAs. This gave a total of 18 secondary schools. The reason for the purposive selection is to ensure coeducational schools comprising boys and girls were selected. All the 384 SSS II Home Economics students in all 18 sampled schools formed the sample for the study.

***Instrument for Data Collection*:** Questionnaire was used to collect date. It was developed through literature review based on specific purposes. It was organized into sections A, B, C and D. Part A was designed to gather respondents' personal information. Part B was designed to obtain information on major causes of fruits and vegetables

consumption. Part C was designed to obtain data on barriers to fruit and vegetable consumption while Part D was designed to collect information on ways to improve consumption of fruit and vegetable practices among students. The 4-point response options for Part B, C and D were: Strongly Agree, Agree, Disagree and Strongly Disagree with the corresponding weight values of 4, 3, 2, and 1 respectively.

The instrument were content validated by three experts; in food and nutritional. Reliability of the questionnaire was achieved by administering the questionnaire to 30 SSS II students in Anambra State. The collected data was analyzed using Cronbach Alpha which yielded a reliability coefficient of 0.79, 0.86 and 0.80 coefficients for sections B, C and D of the questionnaire respectively.

***Data Collection Method*:** Data were collected by the researcher with the help of ten research assistants who were teachers in the selected secondary schools. A total of the 384 copies of the questionnaire were distributed. Only 363 copies were properly responded to and retrieved. This represent 94.5 percent return.

***Data Analysis Technique*:** Data were analyzed using mean ( ) and standard deviation (SD) to answer the research questions. Hypotheses were tested using t-test statistics at 0.05 significance level. A mean ( ) responses of 2.50 was used for decision making based on the 4-point scale of the instrument. Any questionnaire item with a mean value of 2.50 and above (was regarded as "Agreed" while items with mean value of 2.49 and below (were regarded as "Disagreed". The null hypothesis was accepted when the t-calculated value (t-cal) was less than the t-critical (t-tab) value of 1.96. On the other hand, an hypothesis was rejected when the t-calculated value (t-cal) was greater than the t-critical (t-tab) value of 1.96 at 0.05 degree of freedom.

Results

Reasons for Fruits and Vegetables Consumption

Table 1: Mean Ratings of Urban and Rural Senior Secondary School Students on their Reasons for Fruits and Vegetables Consumption

S/N	Reasons for fruits and vegetables consumption	U	SDU	R	SDR	G	SDG	t-cal	RRQ	RHo
1	My parents and guardians provide them for me.	2.09	0.79	2.50	1.06	2.27	0.94	2.57	D	S*
2	They are source of minerals and vitamins.	3.31	0.81	3.55	0.49	3.42	0.70	2.19	A	S*
3	I heard about their nutritional benefits.	3.35	0.71	3.39	0.75	3.37	0.73	0.44	A	NS
4	Some are sweet while some are appetizing.	3.77	0.41	3.77	0.41	3.77	0.41	0.15	A	NS
5	They are the only option available to me whenever I am hungry.	2.04	0.70	2.00	0.74	2.02	0.72	0.26	D	NS
6	There are some of them in my compound.	3.31	0.69	3.38	0.48	3.34	0.61	0.92	A	NS

7	They protect the body against infection	2.96	0.76	2.71	0.65	2.85	0.72	1.43	A	NS
8	They are common food items in my place	3.45	0.65	3.17	0.76	3.32	0.72	2.42	A	S*
9	I eat them because of their health benefits	2.64	0.83	2.77	0.85	2.70	0.84	1.45	A	NS
10	They are not bulky but have fibre to stimulate bowel movement	2.14	0.75	2.33	0.74	2.22	0.75	1.98	D	S*
	Cluster Summary	**2.90**	**0.59**	**2.96**	**0.54**	**2.93**	**0.43**	**1.38**	**A**	**NS**

$_M$ = Mean of male; $_F$ = Mean of female; $_G$ = Grand Mean; SD = Std Deviation; RRQ = Remark on Research Questions; RHo = Remark on Hypothesis; A = Agree; D = Disagree; S* = Significant; NS = Not Significant; t-tab (table) value = 1.96, Urban (U) represents = 200, Rural ® respresents = 163.

Table 1 shows that the grand mean ratings of the respondents on items 2, 3, 4, 6, 7, 8 and 9 were 3.42, 3.37, 3.77, 3.34, 2.85, 3.32 and 2.70 respectively which are in each case greater than the agreed cut-off point value of 2.50 on 4-point rating scale. This revealed that the seven identified items in the Table are "Agreed" as major reasons for fruits and vegetables consumption among students in Delta State. The mean ( ) for items 1, 5 and 10 were 2.27, 2.02 and 2.22 respectively which are in each case less than the agreed cut-off point mean ( ) of 2.50 on 4-point rating scale. This shows that the most of the respondents "Disagreed" that the 3 identified items are major reasons for fruits and vegetables consumption among urban and rural senior secondary school students. The overall mean of urban students was 2.90 which were slightly below that of the rural students with 2.96. This shows that rural students showed slightly higher reasons for consumption of fruits and vegetables than urban Senior Secondary School students in Delta State. The standard deviation values of 10 of the items ranged from 0.41 to 0.94 which indicate that the responses of the respondents are close to the mean.

Table 1 also shows that the t-calculated (t-cal) values of items 1, 2, 8 and 10 were 2.57, 2.19, 2.42 and 1.98 respectively which are in each case greater than the t-table (t-tab) value of 1.96. This analysis indicate a significant difference existing between the mean ratings of the responses of urban and rural school students on the four reasons for consumption fruits and vegetables. Hence, the HO_1 of no significant difference in the mean ratings of urban and rural students was rejected on the four items in the Table.

Hindrances to Consumption of Fruits and Vegetables

Table 2: Mean Ratings of Urban and Rural Senior Secondary School Students on Hindrances to Consumption of Fruits and Vegetables.

SN	Hindrances to consumptions of fruits and vegetables	$_U$	SD_U	$_R$	SD_R	$_G$	SD_G	t-cal	RRQ	RHo
1	Availability of desired fruits and vegetables within my locality.	3.06	0.40	2.52	0.58	2.79	0.52	2.44	A	S*
2	Inadequate finance to buy the fruits and vegetables	3.13	0.93	3.43	0.92	3.28	0.94	2.32	A	S*
3	Inadequate nutritional knowledge of fruits and vegetables	3.41	0.49	3.47	1.00	3.44	0.93	0.43	A	NS
4	Lack of appetite for consumption of fruits and vegetables	3.16	0.66	3.05	0.95	3.10	0.84	0.74	A	NS
5	*High cost of fruits and vegetables in the market*	2.81	0.75	2.42	0.73	2.61	1.17	0.55	A	NS
6	Seasonality of most desired fruits and vegetables	3.63	0.48	3.52	0.50	3.57	0.49	1.13	A	NS
7	Inadequate awareness creation in communities on the benefits of fruits and vegetable.	3.16	0.81	3.58	1.36	3.37	0.77	2.39	A	S*
8	Non coverage of the teaching of fruits and vegetables in Home Economics curriculum	3.20	0.64	3.28	0.82	3.24	0.75	0.41	A	NS
	Cluster Summary	**3.19**	**0.54**	**3.16**	**0.62**	**3.18**	**0.66**	**1.30**	**A**	**NS**

$_M$ = Mean of male; $_F$ = Mean of female; $_G$ = Grand Mean; SD = Std Deviation; RRQ = Remark on Research Questions; RHo = Remark on Hypothesis; A = Agree; S* = Significant; NS = Not Significant; t-tab (table) value = 1.96, Urban N = 200, Rural N = 163

Table 2 shows that the grand mean ratings of the responses of SSS students on the eight items ranged from 2.61 to 3.57 which are in each case greater than the cut-off point value of 2.50 on 4-point rating scale. This indicates that the eight items are "Agreed" by the students as hindrances to urban and rural Senior Secondary School students' consumption of fruits and vegetables in Delta State.

Table 2 reveals that the t-calculated (t-cal) values of items 1, 2 and 7 were 2.44, 2.32 and 2.39 respectively which are in each case greater than the t-table (t-tab) value of 1.96. This signifies that there were significant differences in the mean ratings of the responses of urban and rural SSS students on the three hindrances to consumption of fruits and vegetables. Therefore, the hypothesis of no significant difference in the mean ratings of urban and rural students was rejected on the three items.

Ways of Improving Fruits and Vegetables Consumption Practices.

Table 3: Mean Ratings of Male and Female Senior Secondary School Students on Ways of Improving the Consumption of Fruits and Vegetables.

		Male 172		Female191						
SN	**Ways of Improving Fruits and Vegetables Consumption.**	**$_M$**	**SD_M**	**$_F$**	**SD_F**	**$_G$**	**SD_G**	**t-cal**	**RRQ**	**RHo**
1	Improved provision of fruits and vegetables to students most especially in boarding school by management	3.44	0.64	3.51	0.58	3.47	0.61	1.97	A	S*
2	Increased Nutrition Education for students on the importance of fruits and vegetables choices.	3.54	0.99	3.77	0.57	3.65	0.65	2.38	A	S*
3	Increasing the rate fruit and vegetable consumption.	3.32	0.97	3.77	0.42	3.52	0.80	3.67	A	S*
4	Increasing point-of-purchase (POP) information on fruits and vegetables through labelling	3.23	0.90	3.16	0.68	3.20	0.82	1.98	A	S*
5	Reducing prices of fruits and vegetables as incentive for increased students' consumption in school environment.	2.87	0.81	3.44	0.68	3.12	0.81	3.79	A	S*
6	Increasing availability and varieties of fruits and vegetables in school environment	3.55	0.74	3.71	0.62	3.62	0.69	2.38	A	S*
7	Reduced intake of fast foods such as snacks among students for increase in fruits & vegetable intake.	3.49	0.72	3.59	0.69	3.53	0.71	2.75	A	S*
8	Making fruits and vegetables available and accessible to students	3.10	0.78	3.33	0.41	3.20	0.84	2.37	A	S*
9	Providing charts of different fruits and vegetables, and their nutritional benefits in classrooms	3.66	0.62	3.71	0.55	3.68	0.59	0.94	A	NS
10	Giving awareness talk to students on the value of fruits and vegetables consumption	3.57	0.70	3.52	0.73	3.55	0.71	0.43	A	NS
	Cluster Summary	3.38	0.69	3.55	0.46	3.45	0.52	2.27	A	S*

$_M$ = Mean of male; $_F$ = Mean of female; $_G$ = Grand Mean; SD = Std Deviation; RRQ = Remark on Research Questions; RHo = Remark on Hypothesis; A = Agree; S* = Significant; NS = Not Significant; t-tab (table) value = 1.96**.**

Table 3 shows that the grand mean ratings of the responses of SSS students on 10 items in range from 3.12 to 3.68 which are in each case greater than the cut-off point value of 2.50 on 4-point rating scale. This indicated that majority of the respondents indicated "Agreed" to the 10 items as strategies for enhancing the consumption of fruits and vegetables among male and female SSS Students for in Delta State. The overall mean of male students was 3.38 which was less than that of female students which was 3.55.

Table 3 further shows that the t-calculated (t-cal) values of eight out of 10 items range from 1.97 to 3.79 which are in each case greater than the t-table (t-tab) value of 1.96. This implies that significant differences existed in the mean ratings of the responses of male and female students on the eight identified ways of improving consumption practices of fruits and vegetables. Therefore, the null hypothesis was rejected.

Discussion of Findings

The findings with respect to research question one identified seven major reasons for the consumption fruits and vegetables among Delta State senior secondary school students some of which include: eating of fruits and vegetables due to the fact that they are source of minerals and vitamins to the body, because of their rich nutritional benefits, because some fruits and vegetables are sweet and appetizing, because of the availability within the house premises or compound, and because they protect one's body against infection. Adenegan and Adeoye (2011) documented some of the main facts for intake of fruits and vegetables to include to their great nutritional values as they are important sources of vitamins and minerals and thus, essential components of human diet. Also in agreement with this study's findings, Layade and Adeoye (2014) showed some of the justifications for fruits and vegetables consuming being good sources of few calories with respect to the volume of the food consumed, which favours maintenance of the individuals healthy body weight.

The findings on research question two identified hindrances to fruits and vegetables consumption among students to include: lack of desired fruits and vegetables within my locality, inadequate finance to buy the fruits and vegetables, inadequate nutritional knowledge of fruits and vegetables, lack of appetite for improved consumption of fruits and vegetables, high cost of fruits and vegetables in the market and inadequate awareness creation in communities on the benefits of fruits and vegetable. This findings conformed with that of WHO (2020) who reported that socioeconomic indicators like income, food prices (which ultimately influence the accessibility and affordability of healthy foods), preferences and beliefs of individuals, cultural/traditions, and the aspects of geographical and environmental factors (inclusive of climate change) which influences healthy fruits and vegetables eating habits.

The study identified 10 ways of increasing the fruits and vegetables consumption of senior secondary school students' in Delta State to include: increasing Nutrition Education of students on the benefits of fruits and vegetables choices, improving fruits and vegetables supply to students most especially in boarding schools by management, increasing availability and varieties of fruits and vegetables in school environment, discouraging students'

intake of fast foods such as snacks for increase in fruits and vegetable intake, providing charts of different fruits and vegetables, and their nutritional benefits in classrooms and giving a talk to students on the value of fruits and vegetables consumption in the diet. The findings corroborated that of Lassen et al., (2003) who found in their study that the ways to increase the consuming of fruits and vegetables is through increasing the taking of fruits and vegetables during lunch and that a broad spectrum of approaches that increase attractiveness of fruits and that of vegetables will increase their intake by students. Pérez, Aranceta, Brug, Wind, Hildonen and Klepp (2004) in their study found that provision of fruits and that of vegetables teaching curriculum in schools, increasing availability and different types of fruits and that of vegetables in school environments and provision of charts of different varieties of fruits and that of vegetables and their nutritional importance are functional ways that would enhance consumption pattern of fruits and that of vegetables among students.

Conclusion

Way of promoting fruit and vegetable consumption among SSS students in Delta State, Nigeria were examined in this study. From the results obtained the study concluded that there were eight reasons and likewise eight hindrances for fruits and vegetables consumption among urban and rural SSS students in Delta State. In addition, the study concluded that there were ten identified ways of improving fruits and vegetables consumption practices. The findings from hypotheses revealed no significant differences ($p<0.05$) in the mean ratings of the respondents on 13 out of the 28 items in the study. However, there were significant difference ($p<0.05$) in the mean ratings of the respondents on the remaining 15 items in the study.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. More awareness should be created on the importance, health benefits and nutritional values of fruits and vegetables among SSS students in Delta State secondary schools.
2. Efforts should be made by school authority to promote healthy nutrition education for better understanding of the need to incorporate fruits and vegetables into the daily diets of students.
3. Adequate of various picture, charts of fruits and vegetables and their nutritional benefits should be in classrooms, displayed libraries and laboratories in secondary schools. This will promote students' awareness and acceptance fruits and vegetables consumption for a healthier lifestyle.

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