

Original Research Article

Consumption and factors associating the provision of fruits and vegetables to children in Bayelsa state of Nigeria

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ABSTRACT

Background: The provision of adequate nutrition is of the utmost importance for the promotion of optimal growth and development in the early stages of human life as well as the stimulation of immune system function to combat infections. Therefore, this study aimed to assess the level of consumption and the factors affecting the provision of fruits and vegetables to children in Bayelsa state of Nigeria.

Methods: This was a population-based survey conducted among 360 parents/caregivers of children aged 5 years and below randomly selected from Bayelsa state, Nigeria. The data for this study was collected with in-person interviews utilizing a standardized questionnaire. The results were presented in frequency and percentage. The level of significance was determined using a confidence interval of 95% and $p < 0.05$.

Results: Most of the respondents 355 (98.6%) were female with the age range 25-44 making 86.65% of the total population. Findings show that 40.8% of respondents gave their children fruits and vegetables only once a week while 3.6% gave their children fruits and vegetables 4 times and above a week. The majority of respondents 240 (66.7%) indicated that the high cost of fruits and vegetables was the main factor that affected consumption of fruits and vegetables.

Conclusions: The findings demonstrated a low consumption level of fruits and vegetables among the children in Bayelsa state. Therefore, health professionals should be obliged to educate parents and caregivers of children on adequate provision of fruits and vegetables for their children.

Keywords: Bayelsa state, Consumption, Fruits, Nutrition, Vegetables

INTRODUCTION

Fruits and vegetables are regarded as highly beneficial dietary components due to their rich content of essential elements such as potassium, folate, fibre, vitamin A, vitamin C, vitamin K, and other phytochemicals.¹ Nutrition refers to the biological process involving the intake and utilization of food constituents by organisms.² The process of nutrition encompasses a series of sequential processes, namely food ingestion, digestion, absorption, transport, and metabolism, which collectively

facilitate the utilization of nutrients derived from food. The adequate availability of nutrients is crucial for facilitating healthy physical and cognitive development during the early stages of life.² A dietary pattern characterized by a high intake of fruits and vegetables is linked to increased progress in the growth and development of children and the prevention of childhood diseases.³ Furthermore, the substitution of energy-dense foods with fruits and vegetables has the potential to facilitate effective weight management strategies in the treatment of stunted growth and obesity as well.⁴

Numerous research findings advocate for the enhanced consumption of fruits and vegetables among individuals aged 2 years and above, owing to their significant role in promoting overall health.⁵⁻⁷ Research guidelines specifically underscore the value of consuming whole food sources of fruits and vegetables in adequate quantities. Dietary Guidelines for Americans (DGA) suggests that children between the ages of 2 and 8 have a minimum of 1 to 1.5 cups of fruit and 1 to 1.5 cups of vegetables per day.⁸ The Dietary Guidelines for Americans posits that the recommended amount of fruit and vegetable consumption is dependent on factors such as age, gender, and degree of physical activity, with higher quantities recommended for children who engage in greater physical activity. Despite the well-documented health advantages associated with the consumption of fruits and vegetables, research has shown that a significant proportion of children do not eat adequate levels of fruits and vegetables as recommended by dietary guidelines.⁹ A longitudinal investigation including 60 mother/child pairs revealed a noteworthy correlation between the frequency of fruit and vegetable consumption among children and their level of growth and development as children who had low levels of consumption of fruits and vegetables were found to have a lower level of growth and development in comparison with children who consumed adequate quantities of fruits and vegetables.¹⁰

Moreover, the timely and right introduction of fruits and vegetables also has significant importance, as it can have long-term implications on the child's future preferences and acceptance of fruits and vegetables to ensure that they can eat adequate portions of fruits and vegetables as they grow.¹¹

Several factors have an impact on the consumption of fruits and vegetables by children which includes the age of parents or caregivers of the children, educational status of the parents or caregiver, socioeconomic status, financial limitations, the availability and accessibility of fruits and vegetables, familiarity with the consumption of different varieties of fruits and vegetables, and personal preferences for certain fruits and vegetables.^{12,13} It is essential to have a comprehensive understanding of the factors that affect the consumption of fruits and vegetables, among children as well as the techniques that can be used to address the obstacles that are brought about by these factors, to maximize the efficiency of the efforts that are being made to stimulate the consumption of these foods among children.

Health promotion activities to improve the nutrition of children usually recommend the inclusion of adequate quantities of fruits and vegetables in the children's diet to ensure optimal growth and enhanced immunity.¹⁴

Therefore, this research aimed to examine the feeding level and the factors affecting the provision of fruits and vegetables to children in Bayelsa State, Nigeria.

METHODS

Study design and sample size

This was a descriptive cross-sectional study of fruits and vegetables consumption among parents and caregivers of children aged 5 years and below in primary healthcare facilities and schools randomly selected across the 8 local government areas in Bayelsa state, Nigeria. A total sample size of 360 obtained with the single proportion formula¹⁵ was used for the study.

Sampling techniques

A sample size of 360 parents and carers of children aged 5 years and below was randomly chosen from the 8 local government areas in Bayelsa state over a period of six (6) months (February to July, 2023). During the first phase, a total of eight wards were chosen at random from the pool of eight local government areas to conduct the survey. During the second stage, one (1) primary healthcare facilities and one (1) nursery schools were chosen at random from each ward chosen. The primary health facilities used were: Obunagha Primary Health Care Centre, Gbarain Yenegoa LGA; Twon Brass General Hospital, Brass LGA; Ogboinbiri Cottage Hospital, Southern Ijaw LGA; Okoloba Primary Health Care Centre, kolokuma opokuma LGA; Emeyal 2 Primary Health Care Centre, Ogbia LGA; Nembe-Bassambiri Primary Health Care Centre, Nembe LGA, Agbere Cottage Hospital, Sagbama LGA; Egbemo-Angalabiri Cottage Hospital, Ekeremor LGA. The Nursery Schools used were: Community Nursery and Primary School, Bassambiri, Nembe LGA; Foundation Nursery and Primary School, Samara Montessori School, Gbarain Yenegoa LGA; De Future Academy, Brass, Brass LGA; Community Nursery and Primary School II, Toru-ndoro, Ekeremor LGA; Community Nursery and Primary School I, Isampou, kolokuma opokuma LGA; Community Nursery and Primary School, Otuokpoti, Ogbia LGA; Community Nursery and Primary School, Toru-orua, Sagbama LGA; Community Nursery and Primary School, Otuan, Southern Ijaw LGA. During the third phase, 23 participants were recruited from each of the eight (8) primary healthcare facilities and eight (8) Nursery schools resulting in a total of 360 research participants for the study.

Methods of data collection and analysis

The research data were collected using self-administered questionnaires among the 360 research participants. This study adopted a mixed methods approach. Participants (N=360) included nursery school and primary healthcare workers, and parents from the 8 local government areas in Bayelsa state. The survey questionnaire combined closed-ended Likert-scaled and open-ended questions. Part A focused on the respondent's demographic variables while Part B focused on the feeding level and factors that affect the provision of fruits and vegetables to children

Yenagoa Bayelsa State of Nigeria. Data collected were analyzed using descriptive statistics on Excel and IBM SPSS version 27. The results were expressed as frequency and percentage, level of significance was calculated at a confidence interval of 95% and $p < 0.05$.

Ethical approval

Ethical approval for this study was obtained from the research and ethics committee of Novena University, Ogume, Delta State with ethical approval number: NUO/PCH VOL 1/582. Permission was taken from the chairman of each local government council. Informed

consent was obtained from all participants after detailed explanation of the study procedure with assurance of confidentiality of the information that was collected.

RESULTS

Findings shows that 98.6% of the research respondents were women while only 1.4% were men. The age group with the largest percentage of participants was the age group 25 to 34 years, comprising 44.5% of the total respondents followed by the age group 35-44 years (42.2%). The majority of the participants were married (54.2%), while 37.2% were single mothers.

Table 1: Sociodemographic variables of respondents.

Variables	Options	Frequency (N=360)	Percentage
Sex	Male	5	1.4
	Female	355	98.6
Age	less than 15	5	1.39
	15-24	11	3.06
	25-34	160	44.4
	35-44	152	42.25
	45-54	17	4.8
	55-64	13	3.6
	Above 64	2	0.5
Marital status	Single	134	37.2
	Married	195	54.2
	Divorced	27	7.5
	Widowed	4	1.1
Ethnic group	Akwa Ibom	6	1.67
	Deltans	9	2.53
	Igbos	36	10
	Ijaws	309	85.8
Educational level	SSCE	46	12.8
	Undergraduate	14	3.8
	Graduate	300	83.4
Occupational status	Business	98	27.26
	Civil	14	3.8
	Artisan	125	34.8
	menial work	67	18.61
	Private sector	56	15.5
Level of income (N)	less than 50,000	64	17.7
	51,000-79,000	148	41.1
	80,000-109,000	115	31.9
	110,000-129,000	14	3.9
	130,000-159,000	12	3.63
	160,000-199,000	6	1.8
	Above 200,000	1	0.27
Age of respondents' children	1 year	51	14.2
	2 years	67	18.6
	3 years	87	24.2
	4 years	80	22.2
	5 years	75	20.8

In terms of ethnic group, the majority of the respondents were Ijaw (85.8%), while the minority comprised Igbo (10%), Deltans (2.53%), and Akwa Iboms (1.67%). The educational attainment of the participants showed that most of the respondents (83.3%) were graduates while 12.8% were secondary school leavers. On occupational distribution, 34.7% of the respondents were artisans, 27.2% were into business, and only 3.8% were civil servants. Respondent's income distribution per month in Naira showed that 17.8% earn less than N50,000, while 41.1% of the respondents earn between N51,000-N79,000, and only 9.1% of the respondents earn above N110,000. The under-five years children of the respondents showed that 14.2% of the children were 1 year old, 24.2% were 3 years old, and 22.2% were 4 years old (Table 1).

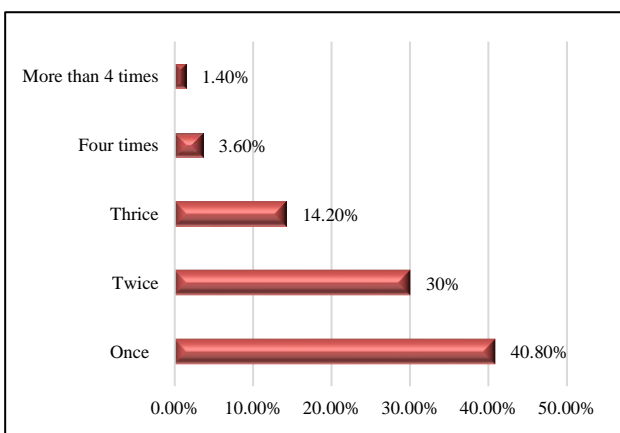


Figure 1: Level of intake of fruits among children of research participants.

The results shows that 144 research participants (40.8%) give their children fruits only once in a week, 108 (30%) give their children fruits twice in a week, 51 (14.2%) give their children fruits thrice in a week, 13 (3.6%) give their children fruits four times in a week, and only 5 (1.4%) give their children fruits more than four times in a week (Figure 1).

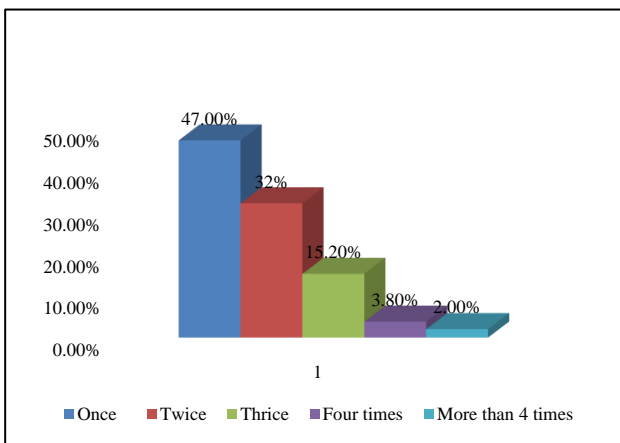


Figure 2: Frequency of vegetables consumption per week among children.

Findings shows that almost half of the participants 168 (47%) give their children vegetables only once a week, 114 (32%) give their children vegetables twice a week, 59 (15.2%) give their children vegetables thrice in a week, 14 (3.8%) give their children vegetables four times in a week, and only 5 (7%) give their children vegetables more than four times in a week (Figure 2).

The results of this study show the factors that affect the provision of fruits and vegetables for children. Only a few of the respondents 20 (5.5%) said fruits and vegetables were not available in their community. While the majority 240 (66.7%) indicated that fruits and vegetables were expensive (Figure 3).

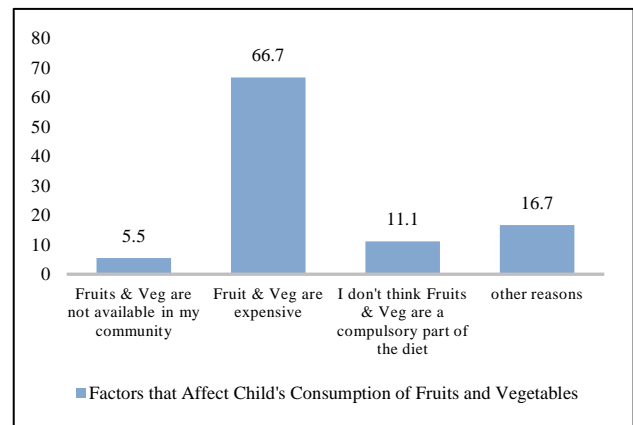


Figure 3: Factors that affect children's consumption of fruits.

DISCUSSION

The findings of this study indicate that 1.4% and 2.0% of the respondents give their children fruits and vegetables four times and above per week respectively. The frequency of fruit and vegetable consumption by the respondents' children is grossly inadequate. This finding is consistent with the findings of a study conducted in Uganda, which observed a significant gap in the high knowledge of parents and caregivers about the benefits of fruits and vegetables and the poor practice of not giving the children in their care adequate quantities of fruits and vegetables.⁹ Although fruits and vegetables constitute a usual part of African dietary patterns, most African children do not eat fruits and vegetables in inadequate quantities.⁹

Research has shown that feeding behaviours including the consumption of adequate levels of fruits and vegetables during the initial stages of life are crucial for the growth and development of children but the level of consumption of fruits and vegetables among children is often inadequate due to the socioeconomic status of their parents or custodians.¹⁶

This study shows that 66.7% of the respondents declared that the high cost of fruits and vegetables was the most

significant factor that affected adequate consumption of fruits and vegetables. The findings of this study shed light on the influence of socioeconomic factors on the frequency of consumption of fruits and vegetables in their diets.

The findings of this research are in alignment with submissions from Scaglioni et al, which demonstrated that the consumption of fruits and vegetables is contingent upon a variety of factors, including the ease with which these food items may be obtained and the level of awareness about the relevance of fruits and vegetables in what constitutes a balanced diet.^{17,18} Furthermore, another researcher posited that the consumption patterns of fruits and vegetables among children are significantly influenced by sociodemographic variables which include the educational level of parents, the socioeconomic status of parents, and their purchasing power.¹⁹ These findings are also in tandem with the findings of James and Wang, that the factors that affect the consumption of fruits and vegetables among children include the economic resources of parents and carers, as well as the level of awareness that the parents and caregivers have about the benefits that are associated with the consumption of fruits and vegetables.¹⁶ Finally, study conducted in Nigeria also highlighted the impact of socioeconomic determinants (education, occupation, level of income) on the ability of parents and caregivers to purchase fruits and vegetables for their children.¹³

Recall bias could be a limitation to this study; however, information on the malnourished children from health mother and care givers was restricted to at most three (3) months preceding the survey and hence recall bias is probably not a major concern in this study.

CONCLUSION

Despite the higher tertiary educational status of the respondents, it does not translate to having adequate knowledge and practice of the importance of providing adequate quantities of fruits and vegetables for their children. In this respect, there is a need for health workers to enlighten parents and caregivers on the importance of providing adequate quantities of fruits and vegetables for children. Parents and caregivers of children should as a matter of necessity introduce fruits and vegetables to their children as early as possible to ensure that the children can accept fruits and vegetables as a regular part of their diet. Moreover, the availability and affordability of fruits and vegetables can be improved by encouraging home gardening of fruits and vegetables among caregivers.

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REFERENCES

1. Slavin J, Lloyd B. Health benefits of fruits and vegetables. *Adv Nutr.* 2012;3(4):506-16.
2. World Health Organization. Nutrition. WHO, Geneva. Available from: https://www.who.int/health-topics/nutrition#tab=tab_1. Accessed on 22 November 2023.
3. del Río-Celestino M, Font R. The health benefits of fruits and vegetables. *Foods.* 2020;9(3):369.
4. Amao I. Health Benefits of Fruits and Vegetables: Review from Sub-Saharan Africa. In: *Importance of Quality Vegetables to Human Health.* IntechOpen; 2018:33-53.
5. Liu R. Health-promoting components of fruits and vegetables in the diet. *Adv Nutr.* 2013;4(3):384S-92S.
6. Ramya V, Patel P. Health benefits of vegetables. *Int J Chem Stud.* 2019;7(2):82-7.
7. Kaparapu J, Pragada P, Geddada M. Fruits and vegetables and its nutritional benefits. In: Egbuna C, Dable Tupas G, eds. *Functional Foods and Nutraceuticals.* Springer, Cham; 2020:241-260.
8. Pem D, Jeewon R. Fruit and vegetable intake: Benefits and progress of nutrition education interventions-narrative review article. *Iran J Public Health.* 2015;44(10):1309-21.
9. Kabwama S, Bahendeka S, Wesonga R, Mutungi G, Guwatudde D. Low consumption of fruits and vegetables among adults in Uganda: findings from a countrywide cross-sectional survey. *Arch Public Health.* 2019;77(4):1-8.
10. Ahmed F, Prendiville N, Narayan A. Micronutrient deficiencies among children and women in Bangladesh: progress and challenges. *J Nutr Sci.* 2017;5:e46.
11. Yahia E, García-Solís P, Celis M. Contribution of fruits and vegetables to human nutrition and health. In: Yahia E, ed. *Postharvest Physiology and Biochemistry of Fruits and Vegetables.* Woodhead Publishing; 2019:19-45.
12. Valmórbida J, Vitolo M. Factors associated with low consumption of fruits and vegetables by preschoolers of low socio-economic level. *J Pediatr.* 2014;90(5):464-71.
13. Kuku-Shittu O, Onabanjo O, Fadare O, Oyeyemi M. Child malnutrition in Nigeria: evidence from Kwara State. *Int Food Policy Res Inst.* 2016;33.
14. Kisiangani I, Mbakaya C, Makokha A, Magu D. Prevalence of malnutrition among preschool children (6-59 months) in western province, Kenya. *J Public Health Epidemiol.* 2014;6(11):398-406.

15. Das S, Mitra K, Mandal M. Sample size calculation: Basic principles. *Indian J Anaesth.* 2016;60(9):652-6.
16. James A, Wang Y. Characterization, health benefits, and applications of fruits and vegetable probiotics. *CyTA-J Food.* 2019;17(1):770-80.
17. Scaglioni S, De Cosmi V, Ciappolino V, Parazzini F, Brambilla P, Agostoni C. Factors Influencing Children's Eating Behaviours. *Nutrients.* 2018;10(6):706.
18. Nandi R, Bokelmann W, Gowdru N, Dias G. Factors influencing consumers' willingness to pay for organic fruits and vegetables: Empirical evidence from a consumer survey in India. *J Food Prod Mark.* 2017;23(4):430-51.
19. Mohseni M, Aryankhesal A, Kalantari N. Factors associated with malnutrition among under five-year-old children in Iran: a systematic review. *Ann Trop Med Public Health.* 2017;10(5).

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