# FACTORS INFLUENCING FRUIT CONSUMPTION AMONG UNDERGRADUATES IN OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, OSUN STATE, NIGERIA

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## ABSTRACT

*This study assessed types of fruit consumed, frequency of consumption and factors influencing consumption of fruit among undergraduates in Obafemi Awolowo University, Ile-Ife, Nigeria. Multistage random sampling technique was used to select 20 respondents each from 13 Faculties of the University making a total of 260 respondents. A well-structured questionnaire was used to collect information on socio-economic characteristics, types of fruit available and consumed, frequency of consumption and factors influencing fruit consumption. Descriptive statistics were used to analyze data, while correlation analysis was used to test the hypothesis. The results showed that 43.8% of the respondents were male and 56.2% were female. The mean age was 21.05±2.7 years. The fruits that were readily available with high percentage of weekly consumption were orange (95.8%), banana (91.9%), apple (77.3%), watermelon (75.8%), pineapple (70.0%), tangerine (66.2%), and pawpaw (50.4%). Likeness (r= 0.289, p= 0.0001), taste (r= 0.206, p= 0.001), appearance (r= 0.145, p= 0.020), health condition (r= 0.141, p= 0.023), season (r= 0.292, p= 0.0001), information by family and friends (r= 0.247, p= 0.0001), texture (r= 0.190, p= 0.002), price (r= 0.212, p= 0.001) and nutritional benefits (r= 0.201, p= 0.001) were factors that had positive relationship with frequency of fruit consumption as revealed by correlation analysis. Factors such as likeness, taste, appearance, health condition, season, available information, texture, price and nutritional benefits influenced consumption of fruit consumed. Nutrition intervention programs and policy should continue to aim at improving consumption of fruits in tertiary institutions to promote healthy eating behaviour.*

***Keywords: Fruit, consumption, undergraduates, factors, frequency.***

## INTRODUCTION

Fruit is a fleshy seed-associated structures of a plant that are sweet and edible in the raw state, such as apples, oranges, grapes, strawberries and bananas. A nut is also considered as fruit according to botanical classification (Mauseth, 2003). It is a widely accepted fact that fruit is an important component of a healthy diet and is associated with numerous positive health outcomes. These outcomes include reduced risk for chronic diseases and benefits to weight management. This is because they are naturally rich source of vitamins and

minerals which are required for the normal functioning of the human body (Hu, 2003). The potential role of fruit in preventing overweight and obesity is related to their relatively low energy density, high content of dietary fiber and associated increasing satiety effect (Rolls, 2005). Fruit has been reported to have beneficial effects on blood cholesterol and to aid in the prevention of large bowel diseases, while it also helps in improving glucose tolerance among diabetic patients and people that consume diets rich in fruits have significantly lower rates of many types of cancer (Paolini, 2003). The superiority of fruits could be related to benefits from the combination or the synergistic effect of nutrients and other phytochemicals in them. Several studies have confirmed the superior benefits derived from fruits consumption as compared to the use of micronutrient supplements (Agudo *et al.*, 2007).

Due to the numerous benefit of fruits, the World Health Organization (WHO) recommends at least five servings of fruits (or vegetables) per day (World Health Organization, 2003a; World Health Organization, 2003b; Díaz-Garcés, *et al.*, 2016). Despite this recommendation, the consumption is still considered very low especially in sub-Saharan Africa (Global Burden of Disease Collaborators, 2019). According to the systematic reviews and meta-analyses conducted by Micha *et al.* (2017), low intake of fruit was attributed to cause 2 million deaths and 65 million Disability-Adjusted Life Year (DALY) in 2017 and was considered as one of the leading dietary risk factors for deaths and DALYs globally and in many countries (Micha *et al.*, 2017; Global Burden of Disease Collaborators, 2019). If an individual's intake of fruit is increased, the global burden will be decreased by 31 % for ischemic disease, 19 % for strokes, 19 % for stomach cancer, 20 % for esophageal cancers, 12 % for lung cancers and 2 % for colorectal cancers (Pomerleau, 2005).

Several studies indicated that both developed as well as developing countries including Nigeria are not meeting minimum daily recommendation for fruit consumption (AL-Otaibi, 2013; Musaiger, *et al.*, 2011). Lifestyle changes around the world indicated a shift towards dietary preferences which are predominated by processed foods and a considerable decrease in fresh foods specifically fruit (Musaiger, 2011). Payette and Shatenotein (2005), reported that socio-economic circumstances, physical factors and psychological wellbeing are factors which affect fruit consumption (Payette and Shatenotein). Other factors such as lifestyle practices, nutritional knowledge, food culture and availability as well as pricing had significant influence on fruit consumption among university students (Schroeder, 2007).

In spite of the growing body of evidence highlighting the protective effects of fruits, their consumption is still grossly inadequate both in developed and developing countries (13). To effectively advocate for consumption of fruit among adolescents and young adults, this study assessed the types of fruit consumed, frequency of

consumption and factors influencing consumption of fruit among students of Obafemi Awolowo University, Ile-Ife, Nigeria.

## RESEARCH METHODOLOGY

The descriptive study design of frequency and factors influencing consumption of fruit was carried out on 260 students in Obafemi Awolowo University, Ile – Ife, Nigeria. Obafemi Awolowo University is a comprehensive public institution established in 1962 as University of Ife. The University is situated on a vast expanse of land totaling 11,861 hectares in Ile-Ife, Osun State, southwest of Nigeria. The University comprises the central campus, the student residential area, the staff quarters and a Teaching and Research Farm. The central campus comprises of the academic, administrative units and service centers while the student residential area is made up of 10 Undergraduate hostels and a Postgraduate hall of residence. Multistage random sampling technique was used to select 20 respondents each from 13 Faculties of the University making a total of 260 respondents. A well-structured questionnaire was used to collect relevant information. Statistical Package for the Social Sciences (SPSS for Windows version 21.0 IBM SPSS Inc.) was used for data analysis. The data collected was analyzed using appropriate descriptive and inferential statistical tools. Correlation analysis was used to determine the relationship that existed between the dependent and independent variables. The dependent variable was the frequency of consumption of fruit and was measured by 24 types of fruit consumed in a 5-point Likert type scale of Rarely (1), Once/week (2), Twice/week (3), Thrice/week (4), More than thrice/week (5) (Zero was recorded for 'Never and Always'). The maximum point was 120 while the minimum point was 24. The mean and standard deviation (SD) of the score was determined and was used to categorize the frequency of consumption of fruit into; 'Low' 'Medium' and 'High' by using the formula "mean ± SD", where respondents with scores within mean + SD was categorized as 'High', those with scores within mean – SD were categorized as 'Low', while those with scores between High and Low were categorized as 'Medium/moderate'. The independent variables were the perceived factors influencing fruit consumption of the respondents. Apart from socio-economic factors, others were presented in metric forms as frequency of response from the respondents. The level of statistical significance was considered at $p<0.05$.

## RESULTS AND DISCUSSION

### Socio-economic characteristics of the respondents

Table 1 shows that majority (62.7 %) of the respondents were of age group 18 – 22 years. The mean age of 21.05 ± 2.7 years was similar to previous studies conducted among undergraduates (Imaledo *et al.*, 2012; Salisu *et al.*, 2018). About 56.2 % were female and 43.8 % were male while most (98.1 %) of the respondents were single. These confirmed that the respondents were adolescents and young adults who are yet to start family life. Majority (48.5 %) had monthly income (pocket money) that is less

than 10,000 naira. This is a confirmation that many undergraduates are depending on their parents or guardians. Majority (61.2 %) had secondary education as previous education. This may be due to the fact that majority of undergraduates in Nigerian universities were products of secondary schools. Majority (88.1 %) were Christians and (85.0 %) were of Yoruba tribe. These must be as a result of the location of the university which is southwest of Nigeria.

**Table 1: Distribution of respondents by socio-demographic characteristics**

| Variables | Frequency (N=260) | Percent (%) |
|---|---|---|
| **Age group(years)** | | |
| <18 | 2 | 0.8 |
| 18-22 | 163 | 62.7 |
| 23-27 | 84 | 32.3 |
| 28-32 | 11 | 4.2 |
| **Sex** | | |
| Male | 114 | 43.8 |
| Female | 146 | 56.2 |
| **Marital status** | | |
| Single | 255 | 98.1 |
| Married | 5 | 1.9 |
| **Allowance(₦)** | | |
| <10,000 | 126 | 48.5 |
| 10,000-19,000 | 97 | 37.3 |
| 20,000-29,000 | 30 | 11.5 |
| 30,000-39,000 | 2 | 0.8 |
| 40,000-49,000 | 4 | 1.5 |
| >50,000 | 1 | 0.4 |
| **Previous education** | | |
| Secondary | 159 | 61.2 |
| NCE or OND | 11 | 4.2 |
| HND, Degree and Others | 90 | 34.6 |
| **Current class (Level)** | | |
| 100 | 78 | 30.0 |
| 200 | 70 | 27.0 |
| 300 | 46 | 17.7 |
| 400 | 43 | 16.5 |
| 500 | 23 | 8.8 |
| **Religion** | | |
| Christianity | 229 | 88.1 |
| Islam | 29 | 11.2 |
| Traditional | 1 | 0.4 |
| Others | 1 | 0.4 |
| **Ethnicity** | | |
| Yoruba | 221 | 85.0 |
| Igbo | 26 | 10.0 |
| Others | 13 | 5.0 |

**Availability and consumption of fruit**

Table 2 shows the available and consumed fruit while Table 3 shows weekly frequency of consumption of fruit. Most frequently consumed and available fruit includes orange, pineapple, banana, pawpaw, watermelon, apple and tangerine while majority of fruit were scarcely available and rarely consumed. This was similar to the study of Ezenwa, *et al.*, (2016) on fruit consumption pattern and nutritional knowledge of undergraduates of Abia State University of Nigeria and also to the study of Ihensekhien, *et al.*, (2017) on frequency of consumption of fruits and vegetables among adults in Edo State, Nigeria.

**Table 2: Distribution of respondents according to fruits available and consumed**

| Fruits | Available (%)(N=260) | Consumed (%)(N=260) |
|---|---|---|
| Orange | 99.6 | 95.8 |
| Pineapple | 92.3 | 70.0 |
| Mango | 58.5 | 41.2 |
| Banana | 99.2 | 91.9 |
| Pawpaw | 73.8 | 50.4 |
| Watermelon | 94.2 | 75.8 |
| Apple | 91.5 | 77.3 |
| Grape | 19.6 | 10.4 |
| Cashew | 25.8 | 15.8 |
| Avocado | 18.1 | 10.4 |
| Pear | 25.0 | 11.9 |
| Guava | 15.0 | 9.6 |
| Coconut | 53.5 | 38.1 |
| Garden egg | 45.0 | 30.0 |
| Tangerine | 83.1 | 66.2 |
| Lime | 29.6 | 16.9 |
| Lemon | 19.2 | 11.2 |
| Walnut | 26.5 | 20.0 |
| Palm fruit | 6.5 | 3.1 |
| Kola nut | 9.2 | 3.8 |
| Cherry | 52.3 | 40.0 |
| Bitter nut | 4.2 | 1.9 |
| Kiwi | 1.2 | 0.4 |

**Table 3: Weekly frequency of fruits consumption**

| Fruits Consumed | Never (%) | Rarely (%) | Once/week (%) | Twice/week (%) | Thrice/week (%) | More than thrice/week (%) |
|---|---|---|---|---|---|---|
| Orange | 4.2 | 29.6 | 18.5 | 8.8 | 3.1 | 1.9 |
| Pineapple | 30.0 | 43.5 | 12.3 | 4.2 | 1.2 | 0.4 |
| Mango | 58.5 | 28.8 | 4.6 | 1.9 | 0.8 | - |
| Banana | 8.1 | 22.7 | 15.8 | 8.5 | 4.6 | 2.3 |
| Pawpaw | 49.2 | 30.8 | 8.8 | 3.5 | 0.8 | 0.4 |
| Watermelon | 24.6 | 23.8 | 16.5 | 6.9 | 0.4 | 1.5 |
| Apple | 21.9 | 30.0 | 16.9 | 6.9 | 1.9 | 0.8 |
| Grape | 89.2 | 9.6 | 0.4 | 0.4 | - | - |
| Cashew | 83.8 | 12.3 | 1.2 | 0.4 | 0.4 | 0.4 |
| Avocado | 89.6 | 8.1 | 1.5 | - | - | - |
| Pear | 87.7 | 9.6 | 2.3 | - | - | - |
| Guava | 89.6 | 9.2 | 0.8 | 0.4 | - | - |
| Coconut | 61.9 | 28.5 | 3.1 | 1.2 | 1.2 | - |
| Tangerine | 33.8 | 31.9 | 8.8 | 5.0 | 2.7 | 0.4 |
| Lime | 83.1 | 15.8 | - | - | 0.4 | - |
| Lemon | 88.8 | 10.0 | 0.8 | - | 0.4 | - |
| Walnut | 80.0 | 15.4 | 2.7 | 0.4 | 0.4 | - |
| Palm fruit | 96.9 | 2.7 | - | - | - | - |
| Kola nut | 96.2 | 3.1 | 0.4 | - | - | - |
| Bitter kola | 96.9 | 2.7 | - | - | - | - |
| Cherry | 59.2 | 28.8 | 5.0 | 0.4 | - | 0.4 |
| Bitter nut | 98.1 | 1.9 | - | - | - | - |
| Kiwi | 98.8 | 1.2 | - | - | - | - |

**Factors influencing fruit consumption**

Table 4 shows the factors that influenced fruits consumption of the respondents. Majority were influenced by likeness (93.1 %), taste (92.3 %), appearance (81.2 %), texture (56.2 %) and season (76.9 %). This is a confirmation of factors influencing fruit consumption among adolescent as stated earlier in the study of Rakhshanderou *et al.,* (2014) on determinant of fruit and vegetable consumption among adolescent in which preference (likeness) and the aesthetic appeal of fruit (taste, appearance, texture) influenced consumption of fruit. The table also shows that price of fruit (56.2 %), availability at home (74.6 %) and nutritional benefits (78.8 %) (69.2 %) influenced fruit consumption which is similar to the study of Schroeder *et al.,* (2007) on fruit and vegetable consumption among college students.

**Table 4: Distribution of respondents by factors influencing fruits consumption**

| Factors | Frequency(N=260) | Percent (%) |
|---|---|---|
| Likeness | 242 | 93.1 |
| Taste | 240 | 92.3 |
| Appearance | 211 | 81.2 |
| Season | 200 | 76.9 |
| Information by family and friends | 180 | 69.2 |
| Texture | 236 | 90.8 |
| Money/Price | 146 | 56.2 |
| Health condition | 25 | 9.6 |
| Availability in school | 55 | 21.2 |
| Availability at home | 194 | 74.6 |
| Nutritional benefits | 205 | 78.8 |

**Relationship between identified factors and fruit consumption**

Table 5 shows that Likeness (r= 0.289, p= 0.000), taste (r= 0.206, p= 0.001), season (r= 0.292, p= 0.000), information by family and friends (r= 0.247, p= 0.000), texture (r= 0.190, p= 0.002), money/price (r= 0.212, p= 0.001), availability in school (r= 0.475, p= 0.000), availability at home (r= 0.207, p= 0.001) and nutritional benefits (r= 0.201, p= 0.001) had significant relationship with frequency of fruits consumption at 0.01 level of significance. Also, Appearance (r= 0.145, p= 0.020) and health condition (r= 0.141, p= 0.023) had significant relationship with frequency of fruits consumption at 0.05 level of significance.

**Table 5: Correlation analysis showing relationship between identified factors and frequency of fruit consumption of the respondent (N=260)**

| Factors | Correlation (r) | Coefficient of Determination($r^2$) | P-value |
|---|---|---|---|
| Likeness | 0.289 | 0.083521 | 0.000** |
| Taste | 0.206 | 0.042436 | 0.001** |
| Appearance | 0.145 | 0.021025 | 0.020* |
| Season | 0.292 | 0.085264 | 0.000** |
| Information by family and friends | 0.247 | 0.061009 | 0.000** |
| Texture | 0.190 | 0.0361 | 0.002** |
| Money/price | 0.212 | 0.044944 | 0.001** |
| Health condition | 0.141 | 0.019881 | 0.023* |
| Availability in school | 0.475 | 0.225625 | 0.000** |
| Availability at home | 0.207 | 0.042849 | 0.001** |
| Nutritional benefits | 0.201 | 0.040401 | 0.001** |

**Significant at the 0.01 level (2-tailed), *Significant at 0.05 level (2-tailed)

## CONCLUSION

Only seven fruits were readily available and consumed while majority of fruit were scarcely available and rarely consumed. Factors such as likeness, taste, appearance, health condition, season, available information, texture, price and nutritional benefits influenced consumption of fruit consumed. Nutrition intervention programs and policy should continue to aim at improving consumption of fruits in tertiary institutions to promote healthy eating-behavior among adolescent and young adult with the aim to reduce incidence of chronic diseases associated with poor intake of fruit in adulthood.

## LIMITATION AND RECOMMENDATION

This study is a cross-sectional study whose main focus was determining consumption of fruit among the respondents while no association was determined between fruit consumption and health outcomes. Further study will be necessary to determine the effect of fruit consumption among the respondents and health status.

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