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SUSTAINABLE CONSUMPTION PATTERNS AND PERCEIVED HEALTH BENEFITS OF AFRICAN WALNUTS IN SOUTH-WEST NIGERIA

Olaoluwa Ayodeji Adebayo¹

ORCID: <https://orcid.org/0000-0002-9902-1236>
E-mail: oriobatemy@gmail.com

Ibiyinka Olubukola Ademiluyi²

ORCID: <https://orcid.org/0000-0003-2291-2804>
E-mail: study4existence@gmail.com

Olufunlola Odunayo Akinola³

ORCID: <https://orcid.org/0009-0006-5746-3243>
E-mail: temyl@yahoo.ca

Udochi Inwon Fingesi⁴

ORCID: <https://orcid.org/0000-0002-0003-736X>
E-mail: ridestar2024@gmail.com

^{1,3}Federal College of Forestry, Forestry Research Institute of Nigeria, Ibadan, Nigeria

²Federal College of Forestry, Forestry Research Institute of Nigeria, Jos, Nigeria

⁴Federal College of Wildlife Management, Forestry Research Institute of Nigeria, New Bussa, Nigeria

Abstract

This study examines the socio-demographic characteristics of African walnut consumers in South-West Nigeria, assesses their consumption patterns, and evaluates consumer perceptions of the nut's health benefits. Understanding these aspects can enhance dietary recommendations, promote sustainable consumption, and improve the market potential of African walnuts. A quantitative survey was conducted among African walnut consumers in South-West Nigeria. Data on socio-demographic factors, consumption frequency, and perceived health benefits were collected and analyzed using descriptive and inferential statistical methods. The study reveals that age, gender, education, and

income levels significantly influence African walnut consumption. The nut is primarily consumed as a snack or dietary component, with health benefits such as cardiovascular improvement, fertility enhancement, and cognitive function frequently cited. Perceptions of health benefits align partially with scientific findings, indicating a need for further public awareness. This study fills a critical gap in understanding the socio-demographic and behavioral factors influencing African walnut consumption. It integrates consumer behavior theories and provides empirical evidence to guide nutrition education, policy formulation, and market development strategies for indigenous functional foods.

Keywords: African walnut, Sustainable consumption, Consumer behavior, Health perception, Nigeria.

INTRODUCTION

African walnut (*Plukenetia conophora*), a highly nutritious and widely consumed nut, plays a significant role in the diets and livelihoods of many people in Nigeria. It is particularly valued for its rich content of essential fatty acids, proteins and antioxidants, which contribute to its perceived health benefits (Uhunmwangho & Omoregie, 2017; Nkwonta et al., 2023). Despite its importance as both a food source and a medicinal product, there remains limited empirical research on the socio-demographic factors influencing its consumption, the patterns of its utilization and the extent to which consumers perceive its health benefits. Understanding these aspects is critical for improving dietary recommendations, promoting sustainable consumption and enhancing the market potential of African walnuts in South-West Nigeria.

The research problem revolves around the gap in scientific knowledge regarding the socio-demographic characteristics of African walnut consumers, their consumption habits and their perceptions of the nut's health benefits. While studies such as Bourais et al., 2023 have documented the nutritional composition and some medicinal properties of African walnuts, there is inadequate research on how factors such as age, gender, education, income and cultural beliefs influence its consumption. Additionally, little is known about how frequently African walnuts are consumed, the preferred modes of preparation and the underlying reasons for their inclusion in diets. Moreover, while traditional knowledge has long emphasized the health benefits of African walnuts including their potential to improve cardiovascular health, fertility and cognitive function there is a lack of structured scientific data on how these benefits are perceived by consumers and whether such perceptions align with scientific findings (Balogun et al., 2023). Addressing these gaps will provide valuable insights for nutritionists, policymakers and agricultural stakeholders interested in promoting African walnuts as a sustainable and beneficial food product.

A review of the existing literature reveals that African walnuts are rich in polyunsaturated fatty acids, antioxidants and essential minerals, making them a promising functional food (Ashaolu & Adeyeye, 2024; Adetunji et al., 2021). Studies have highlighted their potential role in reducing the risk of chronic diseases such as hypertension, diabetes and neurodegenerative conditions (Ni, et al., 2022). However, these studies have primarily focused on biochemical analyses and animal models, with limited investigations into human consumption patterns (Nguyen & Vu, 2023). Furthermore, previous research on indigenous nuts in Nigeria has concentrated on economic and agronomic aspects, neglecting the socio-demographic and health perception dimensions. This emphasizes the need for a comprehensive study that integrates these aspects to provide a holistic understanding of African walnut consumption in South-West Nigeria.

Given this background, the objectives of the study are: (i) to examine the socio-demographic characteristics of African walnut consumers in South-West Nigeria; (ii) to assess the patterns of consumption of African walnuts and (iii) to evaluate consumer perceptions of the health benefits of African walnuts. By achieving these objectives, the study aims to bridge the knowledge gap and provide empirical evidence that can inform nutrition education, policy formulation and the promotion of African walnuts as a healthy dietary component.

Thus, this study was guided by the following research questions:

1. What are the socio-demographic characteristics of individuals who consume African walnuts in South-West Nigeria?
2. What are the prevalent consumption patterns of African walnuts in terms of frequency?
3. How do consumers perceive the health benefits of African walnuts?

Alternatively, the study tested the following hypotheses:

- H₀₁: Socio-demographic characteristics do not significantly influence African walnut consumption patterns.
- H₀₂: There is no significant difference in the perceived health benefits of African walnuts across different socio-economic groups (education level, employment status and household income).

By investigating these questions, this study will provide evidence-based recommendations that can enhance the utilization, marketability and health promotion of African walnuts in Nigeria. The findings will be particularly relevant to stakeholders in nutrition, food policy and agriculture, as well as consumers who seek to optimize their dietary choices for better health outcomes.

LITERATURE REVIEW

Research on African walnuts has primarily focused on their nutritional and medicinal properties. Studies have shown that African walnuts are rich in essential fatty acids, proteins, vitamins and antioxidants, making them a valuable dietary component (Adetunji et al., 2021; Nguyen & Vu, 2023). The presence of bioactive compounds such as flavonoids, phenolics and saponins suggests potential health benefits, including anti-inflammatory, cardioprotective and neuroprotective effects (Elegbeleye et al., 2022). Moreover, African walnuts are commonly consumed as snacks or used in traditional medicine to address ailments such as infertility, hypertension and diabetes (Adetuyi et al., 2022). Despite these documented benefits, research on the actual consumption patterns and factors influencing consumer perceptions remains limited, particularly in South-West Nigeria.

A few studies have examined the socio-economic aspects of African walnut consumption. For instance, Adekeet et al., (2024) found that socio-demographic factors such as age, gender, income and education level significantly influence dietary choices in Nigeria. However, most of these studies focus on staple foods, with little emphasis on indigenous nuts like African walnuts. Additionally, existing research on food consumption behaviors in Nigeria (Enriquez & Archila-Godinez, 2022) suggests that traditional knowledge and cultural beliefs play a crucial role in dietary preferences.

Furthermore, studies on consumption patterns of indigenous nuts and seeds in Nigeria have highlighted issues related to accessibility, seasonal availability and market dynamics (Okigbo & Anyaegbu, 2021). While some studies have explored consumer preferences for locally grown nuts such as cashew and groundnut, African walnuts remain underrepresented in these discussions. This gap in knowledge highlights the importance of the present study in evaluating how social, economic and cultural factors shape the consumption and perception of African walnuts in South-West Nigeria.

Key Theories and Conceptual Frameworks

One of the primary theories relevant to this study is the Theory of Planned Behavior (TPB), developed by Ajzen (1991). The TPB posits that an individual's behavior is determined by their intention to perform that behavior, which is influenced by three key factors: attitudes, subjective norms and perceived behavioral control. In the context of African walnut consumption, this theory helps explain how socio-demographic factors and cultural beliefs, shape consumer choices. For example, individuals with higher levels of education may have greater access to nutritional information, leading to more positive attitudes toward the health benefits of African walnuts. Likewise, social influences, such as family traditions or peer recommendations, may encourage or discourage consumption, while perceived behavioral control—such as ease of access and affordability—can determine whether individuals act on their intentions to consume African walnuts.

Another relevant framework is the Health Belief Model (HBM), introduced by Rosenstock (1974). The HBM provides insight into how individuals perceive health risks and benefits, influencing

their health-related behaviors. This model is particularly useful in understanding how consumers view African walnuts as a functional food and whether perceived benefits, such as improved cardiovascular health and fertility, impact their consumption patterns. The HBM includes key constructs such as perceived susceptibility (the likelihood of developing a health condition), perceived severity (the seriousness of the condition), perceived benefits (the advantages of engaging in a health-promoting behavior) and self-efficacy (confidence in one's ability to take action). These factors can help explain why some individuals prioritize African walnut consumption as a means of improving their health, while others may not, depending on their belief in the nut's nutritional value.

Lastly, the Food Choice and Consumer Behavior Framework proposed by Shepherd and Raats (2006) offers a comprehensive model that integrates psychological, social and environmental factors influencing food choices. This framework is particularly relevant for analyzing how income levels, urbanization and market accessibility affect African walnut consumption. It also considers how traditional knowledge and cultural norms shape dietary habits, providing a holistic perspective on consumer behavior in South-West Nigeria. For instance, the seasonal availability of African walnuts, their affordability compared to other nuts and their perceived status as either a traditional or modern food all contribute to shaping consumer preferences. By applying this framework, the study can assess how external and internal influences determine the demand for African walnuts and their place in contemporary Nigerian diets.

Thus, these theories and frameworks collectively provide a strong foundation for analyzing the factors influencing African walnut consumption in South-West Nigeria. The TPB explains the role of attitudes, social influences and control factors; the HBM highlights the impact of health perceptions on food choices; and the Food Choice and Consumer Behavior Framework integrates socio-economic and environmental influences on consumption patterns. Together, these perspectives offer a comprehensive approach to understanding how socio-demographic characteristics, consumption behaviors and perceived health benefits interact to shape the role of African walnuts in local diets.

Implications of Existing Literature and Theoretical Foundations

The reviewed literature highlights critical gaps in the understanding of African walnut consumption in Nigeria. While nutritional and medicinal studies have established the health benefits of African walnuts, there is limited empirical research on the socio-demographic factors influencing consumption patterns. Thus, existing theories such as TPB and HBM provide useful frameworks for investigating these issues, particularly in assessing how attitudes, beliefs and perceptions influence dietary choices.

Moreover, prior research on indigenous nuts and food consumption in Nigeria suggests that market access, seasonal availability and socio-economic factors play a crucial role in shaping consumption patterns (Okoye & Oni, 2017). However, African walnuts have not been widely explored in this context, making this study essential in filling that knowledge gap. By integrating theoretical perspectives with empirical evidence, this study contributed to a more comprehensive understanding of African walnut consumption, ultimately informing policy recommendations for promoting indigenous foods and improving public health nutrition in Nigeria.

METHODOLOGY

Research Design

This study employed a quantitative, cross-sectional survey design to examine the socio-demographic characteristics, consumption patterns and perceived health benefits of African walnuts in South-West Nigeria. The quantitative approach was chosen to allow for statistical analysis of patterns and trends in walnut consumption. Meanwhile, the cross-sectional design facilitated data collection over a specific period, capturing consumer behavior and perceptions within the selected population. Study Area and Sample Selection.

The study was conducted in South-West Nigeria, specifically in five states known for African walnut production: Ogun, Ondo, Osun, Ekiti and Oyo. These states were selected based on their

significance as major producers of African walnuts within the region. The target population comprised African walnut consumers residing in these areas.

A purposive random sampling technique was employed to select 839 respondents for the study. This sampling method ensured that only individuals with experience in African walnut consumption were included, while randomness was maintained to enhance the study's generalizability. The respondents were drawn from diverse socio-demographic backgrounds, encompassing different age groups, educational levels and income brackets. This diversity allowed for a comprehensive analysis of consumption patterns and perceptions across various consumer groups.

Data Collection Methods

Primary data were collected using a structured questionnaire administered to the respondents. The questionnaire was designed to capture information on key variables, including socio-demographic characteristics (such as sex, marital status, age, body mass index, education, employment and income), frequency of walnut consumption and perceived health benefit of African walnut consumption.

To ensure the validity and reliability of the data collection instrument, questionnaire items were adapted from established scales used in prior research, including those developed by Ghazzawi & Khalid (2019), Yong et al. (2017) and Pawlak et al. (2009). These adaptations ensured that the questions were relevant, culturally appropriate and aligned with the study objectives.

The frequency of walnut consumption was measured using a 6-point Likert-type scale, ranging from "every time" to "rarely." Similarly, perceived health benefits of African walnut consumption were assessed using a 7-point Likert-type scale, ranging from "strongly agree" to "strongly disagree." The use of Likert-type scales allowed for nuanced responses, facilitating a more precise understanding of consumer perceptions and behaviors.

Data Analysis

Data analysis was conducted using descriptive statistical techniques to summarize the key findings. This included the use of means to measure central tendencies in responses, as well as percentages and frequency distributions to describe sample characteristics and consumption patterns. These analytical methods provided insights into the socio-demographic determinants of walnut consumption, common consumption habits and the extent to which consumers' perceived health benefits associated with African walnuts.

Ethical Considerations

Ethical principles were strictly adhered to throughout the research process. Prior to data collection, informed consent was obtained from all participants, ensuring that they understood the study's objectives, their rights and their voluntary participation. To protect respondents' privacy, confidentiality was maintained by anonymizing responses and ensuring that personal data were not disclosed or linked to individual participants. Furthermore, ethical approval for the study was obtained from the relevant research ethics board, ensuring compliance with standard research protocols.

FINDINGS AND DISCUSSION

Socio-Demographic Characteristics of Respondents

The study surveyed 839 respondents, with 60.5% being male ($n = 508$) and 39.5% female ($n = 331$). This indicates a higher participation of men in the study, which may reflect gender differences in walnut consumption patterns or household purchasing decisions in South-West Nigeria. The marital status distribution showed that 76.6% of respondents were married ($n = 643$), while 23.4% were unmarried ($n = 196$). Marriage often influences dietary choices, as household decision-making plays a key role in food consumption patterns. This aligns with prior studies that suggest married individuals are more likely to adopt healthier eating habits due to shared household responsibilities (Goldberg et al., 2021).

The respondents' ages ranged widely, with a mean age of 47.4 years. The largest proportion of participants fell within the 31–50 years category (58.5%), followed by those aged ≥ 51 years (24.0%), while the youngest group (<31 years) accounted for 17.5% of the sample. These findings suggest that middle-aged individuals are the predominant consumers of African walnuts. This trend aligns with previous research, which indicates that adults in their productive years are more health-conscious and seek functional foods such as walnuts for their potential health benefits (Szakos et al., 2022).

Nutritional Status of Respondents

The mean Body Mass Index (BMI) was 27.4 kg/m², categorizing most respondents within the overweight range. The distribution showed that 15.5% were underweight, 33.6% had a healthy weight, 27.5% were overweight and 23.4% were obese. The high prevalence of overweight and obesity suggests a growing nutrition-related health concern in the region. As African walnuts are often consumed for their perceived health benefits, including weight management, it is crucial to investigate whether walnut consumption influences weight regulation. Prior studies indicate that nut consumption, due to its fiber and healthy fat content, may contribute to satiety and weight management (Rosas et al., 2023).

Educational and Employment Status

Education plays a vital role in shaping dietary preferences. Among respondents, 3.6% had no formal education, 9.1% had primary education, 19.7% completed secondary education, 29.0% held a diploma, 21.1% had a bachelor's degree and 17.6% had a postgraduate degree. The high percentage of respondents with tertiary education (48.7%) suggests that educated individuals may be more aware of the nutritional benefits of walnuts, potentially influencing their consumption patterns. This is consistent with studies showing that individuals with higher education levels tend to make more informed dietary choices (Enriquez & Archila-Godinez, 2022).

Employment status revealed that 57.7% of respondents were employed, while 42.3% were unemployed. Employment and financial stability are critical factors in food choices, as employed individuals may have greater purchasing power to include nuts in their diets (Koulierakis et al., 2022). Conversely, financial constraints among unemployed individuals may limit their ability to purchase walnuts regularly, despite their nutritional benefits.

Household Income and Purchasing Power

The mean annual household income was 1.69 million Naira. Income distribution showed that 6.4% of respondents earned less than 0.75 million Naira annually, 29.6% earned between 0.75–1.5 million Naira, while the majority (64.1%) earned over 1.5 million Naira. This suggests that most respondents had a relatively stable financial capacity, which could support frequent walnut consumption. Previous research has demonstrated a positive correlation between income levels and the consumption of nutrient-rich foods, including nuts (McCullough et al., 2024).

Table 1
Socio-demographic characteristics of respondents

Characteristics	Frequency	Percentage
Sex	Male	508
	Female	331
Marital status	Married	643
	Not Married	196
Age (Years) Mean = 47.4	<31	147
	31–50	491
	≥ 51	201
BMI (kg/m ²) Mean = 27.4	<18.5 (Underweight)	130
	18.5–24.9 (Healthy Weight)	282
	25.0–29.9 (Overweight)	231
	≥ 30.0 (Obese)	196
Highest education level	No Formal Education	30
		3.6

	Primary	76	9.1
	Secondary	165	19.7
	Diploma	243	29.0
	Bachelor's Degree	177	21.1
	Post-Graduate	148	17.6
Employment status	Unemployed	355	42.3
	Employed	484	57.7
Annual household income (per 1 Million Naira)	< 0.75	54	6.4
	0.75-1.5	248	29.6
	≥1.5	538	64.1
Mean = 1.69			

Consumption Patterns of African Walnuts in South-West Nigeria

The frequency of African walnut consumption among respondents varied significantly, indicating differing levels of preference, accessibility and cultural significance. As presented in Table 2, 16.2% of respondents consumed African walnuts every time they had the opportunity, demonstrating a strong preference and highlighting its dietary importance. Similarly, 14.8% reported consuming walnuts about 90% of the time, reinforcing the consistent inclusion of walnuts in their diet. These two groups, constituting approximately 31% of the respondents, suggest that a substantial segment of the population perceives walnuts as a staple snack or dietary component. This finding aligns with prior studies that recognize African walnuts as a functional food, rich in antioxidants and healthy fats, contributing to improved cardiovascular health and overall well-being (Adetunji et al., 2021; Ashaolu & Adeyeye, 2024).

The most frequent category of consumption was among those who ate walnuts about 70% of the time (22.5%), reflecting a high level of demand with potential economic impact. This suggests that beyond personal preference, factors such as availability, affordability and seasonality influence consumption. The moderate consumption group (15.5%) indicated that they ate walnuts only about 50% of the time they could, possibly due to seasonal variation, taste preferences, or limited access.

Meanwhile, 19.7% of respondents reported occasional consumption (about 30% of the time), highlighting its cultural significance rather than an everyday dietary habit. Traditional beliefs and social contexts may influence this consumption pattern, as African walnuts are sometimes associated with medicinal or ceremonial use in certain Nigerian communities (Unya, 2021).

Lastly, 11.3% of respondents reported rarely consuming African walnuts (less than 10% of the time available), indicating a low level of preference. This suggests potential areas for targeted consumer education and marketing strategies to increase walnut consumption, especially among those unaware of its health benefits.

Table 2

Consumption pattern of African walnuts in South-West, Nigeria and its implications

Frequency of African walnut consumption	Percentage	Implications
Every time	16.2	Strong preference, dietary importance
Usually, in about 90% of the chances I could have.	14.8	Consistent consumption, dietary importance
Frequently, in about 70% of the chances when I could have	22.5	Frequent consumption, potential economic impact
Sometimes, in about 50% of the chances when I could have	15.5	Moderate consumption, taste or availability factor
Occasionally, in about 30% of the chances when I could have	19.7	Occasional consumption, cultural significance
Rarely, in less than 10% of the chances when I could have	11.3	Infrequent consumption, potential for awareness

Perceived Health Benefits of African Walnut Consumption

The study examined respondents' perceptions of the health benefits associated with African walnut consumption. The results, presented in Table 3, indicate that African walnuts are widely recognized for their anti-inflammatory properties, cancer risk reduction and gut health benefits. The grand mean score of 4.6 suggests that, overall, respondents have a positive perception of the health benefits of African walnuts, though some benefits are more widely acknowledged than others.

The highest-rated health benefit was "may decrease inflammation" (5.8), indicating strong recognition of walnuts' potential role in reducing inflammatory responses. This aligns with previous studies highlighting the anti-inflammatory effects of polyphenols and omega-3 fatty acids present in walnuts, which contribute to the prevention of chronic diseases such as arthritis, cardiovascular diseases and metabolic disorders (Nguyen & Vu, 2023). The belief that African walnuts "may reduce the risk of some cancers" (5.4) further reinforces their perceived importance in disease prevention. Research by Balogun et al., (2023) has similarly emphasized the anticarcinogenic properties of phytochemicals found in African walnuts, which may inhibit tumor growth and reduce oxidative stress.

Additionally, walnuts were perceived to "promote a healthy gut" (5.3) and "support reproductive health" (5.2), suggesting that consumers associate them with digestive well-being and fertility enhancement. These perceptions align with scientific findings that highlight the prebiotic effects of walnuts, which promote the growth of beneficial gut bacteria, as well as their role in improving sperm quality and hormonal balance (Fitzgerald et al., 2021). The recognition of walnuts as a "super plant source of omega-3s" (5.1) further highlights their nutritional value, as omega-3 fatty acids are essential for brain health, cardiovascular function and inflammation control.

While respondents acknowledged walnuts' role in weight control (4.9), improving blood fats (4.8) and managing type 2 diabetes (4.7), these benefits were slightly lower in perception compared to anti-inflammatory and anticancer properties. The relatively lower scores for "may help lower blood pressure" (4.5), "supports healthy ageing" (4.4) and "supports good brain function" (4.2) suggest that more consumer education may be needed to enhance awareness of these benefits. Scientific literature supports the role of walnuts in cognitive health, cardiovascular disease prevention and longevity, yet the lower scores may indicate a lack of widespread knowledge or scientific communication regarding these benefits (Cahoon et al., 2021).

Interestingly, the lowest-rated benefits were "rich in antioxidants" (3.4) and "widely available always and easy to add to diets" (2.6). This suggests that while walnuts are recognized for certain major health benefits, their antioxidant properties and ease of consumption are not as widely acknowledged. The low rating for availability may reflect seasonal fluctuations, supply chain challenges and affordability issues, which limit consistent access to African walnuts in South-West Nigeria.

Table 3
Perceived Health Benefits of African Walnut Consumption

Perceived Health Benefits of African walnuts consumption....	Mean Score
...may decrease inflammation	5.8
...may reduce the risk of some cancers	5.4
...promotes a healthy gut	5.3
...supports reproductive health	5.2
...super plant source of omega-3s	5.1
...supports weight control	4.9
...improves blood fats	4.8
...may lower risk and help manage type 2 diabetes	4.7
...may help lower blood pressure	4.5
...supports healthy ageing	4.4
...supports good brain function	4.2
...rich in antioxidants	3.4
...widely available always and easy to add to diets	2.6
Grand Mean	4.6

Test of hypotheses

Influence of Socio-Demographic Characteristics on African Walnut Consumption Patterns

The results of the chi-square test of independence (Table 4) indicate that some socio-demographic characteristics significantly influence African walnut consumption patterns. Specifically, significant associations were found between walnut consumption frequency and respondents' sex ($\chi^2 = 12.45$, $p = 0.030$), age ($\chi^2 = 18.72$, $p = 0.045$), BMI ($\chi^2 = 20.34$, $p = 0.030$), education level ($\chi^2 = 25.12$, $p = 0.012$), employment status ($\chi^2 = 11.62$, $p = 0.041$) and annual household income ($\chi^2 = 16.89$, $p = 0.038$). These results suggest that individuals with higher educational attainment, stable employment and higher income levels tend to consume African walnuts more frequently. This could be attributed to increased health awareness and financial capability to afford diverse food options, including functional foods such as African walnuts. Similarly, individuals with a higher BMI were more likely to consume walnuts frequently, possibly due to a greater emphasis on dietary modifications for weight management and overall health improvement.

Conversely, marital status was not significantly associated with walnut consumption ($\chi^2 = 8.53$, $p = 0.220$), indicating that being married or single does not strongly determine the frequency of walnut consumption. This lack of significance may suggest that factors such as personal dietary preferences and awareness of health benefits play a more crucial role in influencing walnut consumption than marital obligations or household composition. These findings highlight the importance of targeting specific demographic groups, particularly those with lower education and income levels, in promotional campaigns aimed at increasing walnut consumption in Nigeria.

Table 4

Chi-Square Test Results

Socio-Demographic Factor	χ^2 Value	df	p-value	Decision
Sex	12.45	5	0.030*	Reject H_{01}
Age	18.72	10	0.045*	Reject H_{01}
Marital Status	8.53	5	0.220	Fail to Reject H_{01}
Body Mass Index	20.34	15	0.030*	Reject H_{01}
Education Level	25.12	10	0.012*	Reject H_{01}
Employment Status	11.62	5	0.041*	Reject H_{01}
Annual Household Income	16.89	10	0.038*	Reject H_{01}

Differences in the perceived health benefits of African walnuts across different socio-economic groups

A one-way ANOVA test was conducted to assess whether there were significant differences in the perceived health benefits of African walnuts across different socio-economic groups, namely education level, employment status and household income. The results (Table 5) revealed statistically significant differences in all three socio-economic factors examined ($p < 0.05$).

The analysis revealed a statistically significant difference in perceived health benefits across different education levels ($F = 4.89$, $p = 0.014$). This finding suggests that individuals with varying levels of education perceive the health benefits of African walnuts differently. Higher education levels may be associated with increased awareness and knowledge of the nutritional and medicinal benefits of African walnuts, as supported by previous studies (Balogun et al., 2023; Edo et al., 2024). Educated individuals are more likely to access scientific information on functional foods (Martirosyan et al., 2021), which may explain the observed differences.

A significant difference was also found in perceived health benefits based on employment status ($F = 6.23$, $p = 0.008$). This finding suggests that individuals with different employment conditions perceive the health benefits of African walnuts differently. Formal sector employees may have greater awareness of these benefits due to workplace wellness programs and access to health-related information. In contrast, unemployed or informally employed individuals may have limited exposure to such knowledge. This is consistent with the findings of Enriquez & Archila-Godinez, (2022) who reported that employment status significantly influences dietary choices and awareness of functional foods.

The ANOVA results also indicated significant differences in perceived health benefits across household income groups ($F = 3.45$, $p = 0.035$). Households with higher income levels may have better access to health-related information and are more likely to consume African walnuts for their purported health benefits (McCullough et al., 2024). Lower-income groups, on the other hand, may perceive these benefits differently due to affordability, availability and competing food choices (Dolislager et al., 2022).

Table 5
ANOVA Test Results

Socio-Economic Factor	F-Statistic	p-value	Decision
Education Level	4.89	0.014*	Reject H_{02a}
Employment Status	6.23	0.008*	Reject H_{02b}
Household Income	3.45	0.035*	Reject H_{02c}

Note that * = ($p < 0.05$)

These findings give emphasis to the importance of targeted nutrition education programs to bridge knowledge gaps across different socio-economic groups. Policymakers and health professionals should focus on promoting awareness campaigns, particularly among lower-income and less-educated populations, to enhance their understanding of the health benefits of African walnuts. Additionally, employment-based health promotion initiatives can further reinforce the importance of functional foods in disease prevention. Furthermore, future research should explore additional factors such as cultural beliefs, dietary habits and access to scientific information that may further explain variations in perception across socio-economic groups.

CONCLUSIONS

This study examined the socio-demographic characteristics, consumption patterns and perceived health benefits of African walnuts in South-West Nigeria. The findings reveal that key factors such as gender, age, marital status, education level, employment status and household income significantly influence walnut consumption. Middle-aged individuals, particularly those with higher education and stable incomes, demonstrated greater awareness of the nutritional and health benefits of African walnuts, supporting previous research on functional food consumption.

The study also highlights variations in consumption frequency, with a substantial proportion of respondents regularly incorporating walnuts into their diets due to their perceived health benefits, including cardiovascular support and overall well-being. However, factors such as accessibility, affordability and cultural beliefs contribute to differences in consumption habits, indicating potential areas for consumer education and market expansion.

This research contributes to sustainability, consumer behavior studies and food management by providing insights into the socio-economic determinants of African walnut consumption. Understanding these factors can inform policies and strategies aimed at promoting sustainable food choices, improving nutritional awareness and enhancing the market potential of indigenous food products. Future studies should explore the impact of targeted awareness campaigns and value chain development to increase the accessibility and adoption of African walnuts as a staple functional food.

Research ethics statement

This article is the authors' own original work, which has not been previously published elsewhere.

Author contribution statement

Adebayo, O. A.: Conceptualization; Literature Review; Methodology; Data Collection; Data Analysis; Manuscript Drafting; Manuscript Review & Editing; Supervision; Funding & Resources; Final Approval; Correspondence.

Ademiluyi, I. O.: Literature Review; Manuscript Drafting; Manuscript Review & Editing; Supervision.

Akinola, O. O.: Methodology; Data Collection; Data Analysis; Manuscript Drafting; Manuscript Review & Editing.

Fingesi, U. I.: Literature Review; Methodology; Data Collection; Data Analysis; Manuscript Drafting

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References

- Adeke, A. S., Chori, B. S., Neupane, D., Sharman, J. E. & Odili, A. N. (2024). Socio-demographic and lifestyle factors associated with hypertension in Nigeria: results from a country-wide survey. *Journal of Human Hypertension*, 38(4), 365-370.
- Adetunji, J. B., Adetunji, C. O. & Olaniyan, O. T. (2021). African walnuts: A natural depository of nutritional and bioactive compounds essential for food and nutritional security in Africa. *Food security and safety: African Perspectives*, 331-354.
- Adetuyi, B. O., Odine, G. O., Olajide, P. A., Adetuyi, O. A., Atanda, O. O. & Oloke, J. K. (2022). Nutraceuticals: role in metabolic disease, prevention and treatment. *World News of Natural Sciences*, 42, 1-27.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Ashaolu, T. J. & Adeyeye, S. A. (2024). African functional foods and beverages: a review. *Journal of Culinary Science & Technology*, 22(1), 142-177.
- Balogun, M. E., Manzuma, A. O., Ayinde, T. O. & Folami, S. O. (2023). *Tetracarpidium Conophorum* (African Walnut): A Review of Pharmaceutical Evidence on Cardiac Toxicity. *Al-Hikmah Journal of Health Sciences*, 3(1), 36-43.
- Balogun, M. E., Manzuma, A. O., Ayinde, T. O. & Folami, S. O. (2023). *Tetracarpidium Conophorum* (African Walnut): A Review of Pharmaceutical Evidence on Cardiac Toxicity. *Al-Hikmah Journal of Health Sciences*, 3(1), 36-43.
- Bourais, I., Elmarrkechy, S., Taha, D., Mourabit, Y., Bouyahya, A., El Yadini, M. Machich O, El Hajjaji S, El Boury H, Dakka N. & Iba, N. (2023). A review on medicinal uses, nutritional value and antimicrobial, antioxidant, anti-inflammatory, antidiabetic and anticancer potential related to bioactive compounds of *J. Regia*. *Food Reviews International*, 39(9), 6199-6249.
- Cahoon, D., Shertukde, S. P., Avendano, E. E., Tanprasertsuk, J., Scott, T. M., Johnson, E. J., ... & Nirmala, N. (2021). Walnut intake, cognitive outcomes and risk factors: a systematic review and meta-analysis. *Annals of Medicine*, 53(1), 972-998.
- Dolislager, M., Liverpool-Tasie, L. S. O., Mason, N. M., Reardon, T. & Tschirley, D. (2022). Consumption of healthy and unhealthy foods by the African poor: Evidence from Nigeria, Tanzania, and Uganda. *Agricultural Economics*, 53(6), 870-894.
- Edo, G. I., Samuel, P. O., Nwachukwu, S. C., Ikpekoru, V. O., Promise, O., Oghenegueke, O. & Ajakaye, R. S. (2024). A review on the biological and bioactive components of *Cyperus esculentus* L.: insight on food, health and nutrition. *Journal of the Science of Food and Agriculture*, 104(14), 8414-8429.

- Elegbeleye, J. A., Krishnamoorthy, S., Bamidele, O. P., Adeyanju, A. A., Adebowale, O. J. & Agbemavor, W. S. K. (2022). Health-promoting foods and food crops of West-Africa origin: The bioactive compounds and immunomodulating potential. *Journal of Food Biochemistry*, 46(11), e14331.
- Enriquez, J. P. & Archila-Godinez, J. C. (2022). Social and cultural influences on food choices: A review. *Critical Reviews in Food Science and Nutrition*, 62(13), 3698-3704.
- Enriquez, J. P. & Archila-Godinez, J. C. (2022). Social and cultural influences on food choices: A review. *Critical Reviews in Food Science and Nutrition*, 62(13), 3698-3704.
- Fitzgerald, E., Lambert, K., Stanford, J. & Neale, E. P. (2021). The effect of nut consumption (tree nuts and peanuts) on the gut microbiota of humans: a systematic review. *British Journal of Nutrition*, 125(5), 508-520.
- Ghazzawi, H. A. & Khalid, A. L. (2019). Consumption practices, preferences and barriers of nuts intake amongst university of Jordan students. *Clinical Nutrition Experimental*, 24, 45-53.
- Goldberg, A. E., McCormick, N. & Virginia, H. (2021). Parenting in a pandemic: Work-family arrangements, well-being and intimate relationships among adoptive parents. *Family Relations*, 70(1), 7-25.
- Koulierakis, G., Dermatis, A., Vassilakou, N. T., Pavi, E., Zavras, D. & Kyriopoulos, J. (2022). Determinants of healthy diet choices during austerity in Greece. *British Food Journal*, 124(9), 2893-2910.
- Martirosyan, D., Kanya, H. & Nadalet, C. (2021). Can functional foods reduce the risk of disease? Advancement of functional food definition and steps to create functional food products. *Functional Foods in Health and Disease*, 11(5), 213-221.
- McCullough, E. B., Lu, M., Nogue, Y., Arsenault, J. & Zhen, C. (2024). Nutrient adequacy for poor households in Africa would improve with higher income but not necessarily with lower food prices. *Nature Food*, 5(2), 171-181.
- McCullough, E. B., Lu, M., Nogue, Y., Arsenault, J. & Zhen, C. (2024). Nutrient adequacy for poor households in Africa would improve with higher income but not necessarily with lower food prices. *Nature Food*, 5(2), 171-181.
- Nguyen, T. H. & Vu, D. C. (2023). A review on phytochemical composition and potential health-promoting properties of walnuts. *Food Reviews International*, 39(1), 397-423.
- Ni, Z. J., Zhang, Y. G., Chen, S. X., Thakur, K., Wang, S., Zhang, J. G., Shang, Y.F. & Wei, Z. J. (2022). Exploration of walnut components and their association with health effects. *Critical Reviews in Food Science and Nutrition*, 62(19), 5113-5129.
- Nkwonta, C. G., Auma, C. I. & Gong, Y. (2023). Underutilised food crops for improving food security and nutrition health in Nigeria and Uganda—a review. *Frontiers in Sustainable Food Systems*, 7, 1126020.
- Okigbo, R. N. & Anyaegbu, C. F. (2021). Underutilized plants of Africa. *Journal of Biology and Nature*, 13(2), 34-49.
- Okoye, J. & Oni, K. (2017). Promotion of indigenous food preservation and processing knowledge and the challenge of food security in Africa. *Journal of Food Security*, 5(3), 75-87.
- Pawlak, R., Colby, S. & Herring, J. (2009). Beliefs, benefits, barriers, attitude, intake and knowledge about peanuts and tree nuts among WIC participants in eastern North Carolina. *Nutrition Research and Practice*, 3(3), 220-225.
- Rosas Jr, M., Liu, C. & Hong, M. Y. (2023). Effects of mixed nut consumption on blood glucose, insulin, satiety and the microbiome in a healthy population: A pilot study. *Journal of Medicinal Food*, 26(5), 342-351.
- Rosenstock, I. M. (1974). The health belief model and preventive health behavior. *Health education monographs*, 2(4), 354-386.
- Shepherd, R. & Raats, M. (Eds.). (2006). *The psychology of food choice*. Cabi.
- Szakos, D., Ózsvári, L. & Kasza, G. (2022). Health-related nutritional preferences of older adults: A segmentation study for functional food development. *Journal of Functional Foods*, 92, 105065.
- Uhunmwangho, E. S. & Omoregie, E. S. (2017). Evaluation of nutritive, anti-nutritive and mineral content of *Tetracarpidium conophorum* (African Walnut) seed oil at different stages of fruit maturation. *Haya: Saudi Journal. Life Science*, 2(6), 210-216.

- Unya, I. U. (2021). The historical significance and role of the kola nut among the Igbo of South-Eastern Nigeria. *UNIZIK Journal of Religion and Human Relations*, 13(1), 289-312.
- Yong, L. C., Gray, A. R., Chisholm, A., Leong, S. L., Tey, S. L. & Brown, R. C. (2017). Barriers to and facilitators and perceptions of nut consumption among the general population in New Zealand. *Public Health Nutrition*, 20(17), 3166-3182.

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