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Original Article

# Public Awareness and Perception of Antioxidant Supplements in Preventing Oxidative Stress-Related Diseases in South South Nigeria

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**ABSTRACT**

**Background:** An investigation was conducted to organize the public's facts and concept of antioxidant supplements as a therapy or preventive measure for oxidative stress-associated issues in Abak Local Government Area, Akwa Ibom State, Nigeria. This was due to the fact that oxidative stress-related ailments, like cancer and cardiovascular disease, are more common, there is a growing interest in antioxidant supplements, which are thought to lower oxidative damage and improve health.

**Methods:** The study was a cross-sectional study involving 100 respondents from a variety of demographic backgrounds. The interviews utilizing an organized questionnaire to assess their information, attitudes, and sources of information about antioxidants and their knowledge of their use in general practice. The Statistical Package for Social Sciences [SPSS] was used to analyze the results.

**Results**: About 47% of respondents opined that antioxidants had incorrect roles in the prevention of sickness, while 43% of respondents knew nothing about these substances. Additionally, 63% of respondents depend on friends, social media, and amateur sources in addition to other sources, raising concerns about the quality of facts being publicized. However, eighty per cent of respondents expressed a need for more correct health information, underscoring the need for targeted education campaigns.

**Conclusion:** This work advances our understanding of nutrition and public health by emphasize the critical duty reliable data play in the persuasive treatment of problems associated with oxidative stress in community health initiatives.

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**Keywords**: public awareness, antioxidants**,** Supplements, Perception.

**INTRODUCTION**

Oxidative stress is a crucial factor in the carcinogenesis process[1] and while cancer therapy outcomes have improved, cancer remains a systemic sickness after a certain point. Because the complete recovery of cancer patients following a particular treatment is challenging, a multidisciplinary strategy including surgery, chemotherapy, radiation, and immunotherapy is commonly employed[2.] The severity of oxidative stress in public health is worrying and has increased. Antioxidants, such as vitamins A, C, E, selenium, zinc, copper, and manganese, help reduce the detrimental effects of oxidative related stress in nutrition and human health by trapping and counteracting free radicals.[3] Green tea, strawberries, eggplant, garlic, ginger, and other foods are essential and has anti-oxidantive properties in food, which have been showed to have a variety of pharmacological actions too, as well as the treatment of lipid metabolic anomalies.[4] Obesity being a disease of body mass index more than 25kg/m2 is widely recognized to produce oxidative stress via several methods and in different ways.[1,4] The first procedure is mitochondrial and peroxisomal fatty acid disintegration, which can produce reactive oxygen species (ROS) in oxidation reactions, while another is oxygen overconsumption, which produces free radicals in the mitochondrial respiring chain and guides oxidative phosphorylation in mitochondria.[5] Reversing the impact of corpulence on oxidative stress and swelling is essential to lessening the disastrous impacts of corpulence.[6] The pretended designs of antioxidants differ, and they may be classified as hydrophilic (dissolved in water) or hydrophobic (soluble in fat). While fat-dissolved antioxidants are more inclined insulate cell membranes from ROS-mediated lipid peroxidation, water-dissolved antioxidants usually respond with ROS inside cells or body fluids (blood antitoxin, extracellular fluid, seminal plasma)[7] Polyphenols contained in pigmented rice may play a crucial role in focusing certain therapeutic pathways in obesity-related oxidative stress and inflammation[8], Like every other location in Nigeria, the population in this study area may lack enough knowledge and could perceived substances regarding the antioxidant supplements at low rate, thus Preventing Oxidative Stress-Related Diseases; consequently, knowing the antioxidants and the supplements helps in successful health treatments.[9]

**Oxidative Stress and Its Implications:** Oxidative stress has been powerfully implicated in the pathogenesis of traumatic brain injury (TBI). Mitochondrial ferritin (Ftmt) is reported to be closely related to oxidative stress.[10-12] However, whether Ftmt is involved in TBI-induced oxidative stress and neurological deficits remains unknown.[13]. Increasing evidence shows that oxidative stress induced by abnormal accumulation of reactive oxygen species (ROS) plays an main role in the pathogenesis of TBI[14-15], in accordance with Wang[16], Excessive levels of oxidative stress can cause protein, nucleic acids and lipids damage, leading to neurological dysfunction,

additionally, [17] stated that Vascular calcification is closely related to cardiovascular morbidity and mortality and also indicated that oxidative stress is associated with dysfunction of differing organs, along with cardiovascular ailments in incessant kidney ailment (CKD), Excessive production of oxidative stress results in various deleterious occurrences by irrevocable modification of biomolecules, including lipids, proteins, and DNA[18-21] Regarding diabetes, raised ROS and hyperglycemia damage the pancreatic β-cells and consequently induce type 1 DM [22]

**Antioxidants:** Excessive oxygen free radicals can lead to ageing, cancer, and other ailments. Therefore, searching for productive antioxidants to scavenge oxygen-free radicals has become the focus of modern medicine [22-.23] stated that natural antioxidants in ingested foods include tocopherols, ascorbic acid, carotenoids, flavonoids, amino acids, phospholipids, and sterols. They serve a main function in scavenging free radicals and non-radical oxidants and protecting cells from oxidative stress and damage. The evidence that oxidative damage is immediately linked to various disorders, including cancer, neuro-degeneration, and diabetes, stresses the need for antioxidants. Several ways to improve human health and lifespan incorporate dietary antioxidants into diets and fortified foods [24]. Antioxidants also help to hold food fresher for longer. Fortified or designer meals that are enhanced with antioxidant nutrients and the exercise of microorganisms as probiotics are suitable and more accessible in the market as fitness foods.[24], According to[25], antioxidants are classified into two types established by their method of operation: (i) deterrent antioxidants, which interfere with the start process by delaying or staying the formation of radical class, and (ii) chain-breaking antioxidants, that hinder autoxidation by playing with propagation reactions; that is, they respond with radicals faster than the oxidizable substrate. In addition to these direct antioxidants, substances that do not hold antioxidant activity but can advance and boost the efficiency of the endogenous antioxidant defences in biological systems, are usually categorized as indirect antioxidants [26-29.]

## MATERIALS AND METHODS

**Study Area:** This study was carried out in Abak Local Government Area, one of the 31 LGA of Akwa Ibom State. Akwa Ibom State is one of the oil producing states in Nigeria located in the coastal southern part of the country with Uyo as the state capital. It lies between latitude $48^{o}32N$ and $5^{o}25E$ and longitude $7^{0}25N$ and $8^{0}25E$. The people of Akwa Ibom State are predominantly Christians and the main economic activities of the people are fishing for riverine and coastal dwellers, farming mostly for upland dwellers, trading, artisanship and civil services. Abak Local Government Area is in Ikot Ekpene senatorial district of the state, having rich foods and cultural heritage.

### Study Design

The study was a descriptive cross-sectional survey

### Study Population

The target population was 18 years old and above and lived in the Abak Local Government Area for at least a year.

**Sample size determination:**

Sample size was estimated using William Cochran's method for cross sectional survey

Sample size $\mathbf{n = \frac{Z^2Pq}{d^2}}$ …[19]

**n** = Sample size

**Z =** Standard normal deviation set at 1.96 to correspond to 95% confidence interval.

**P** = highest Prevalence of the condition under study from related studies.

**q** = **1-P**

**d =** Degree of precision at a confidence level of 95% (Error margin allowed from study which is a measure of level of accuracy)

Z = 1.96

P = 20.0 = 0.20 (highest prevalence from literature review

d = 0.05

From the formula; $n = \frac{Z^2Pq}{d^2}$

$n = \frac{(1.96)^2 \times 0.20 \times 0.3)}{(0.05)^2}$

$n = \frac{3.8416 \times 0.06}{0.0025} = \frac{0.6592}{0.0025}$

Minimum sample size, n = 92.16

Assuming a non-response rate of 10%, the study sample size would be 102, approximately 100 participants.

Study Sample size used in this study = 100

**Sampling technique:**

Multistage sampling technique was used for this survey.

Stage I: Abak LGA was selected by convenience sampling to be used as study area

Stage II: Wards and villages were selected using simple random sampling technique (balloting method).

Stage 111: Participants were selected using simple random sampling technique (balloting method).

**Study Instruments:**

A semi structured, questionnaire was used. This paper based questionnaire survey instrument was derived based on study objectives and also from previous surveys, studies or reviews pertaining to Public awareness and perception of antioxidant supplements in preventing oxidative stress-related diseases. The questions were in simple English language, short and direct to prevent misunderstanding. The questionnaire was divided into three sections:

**SECTION A;** socio-demographic characteristics of the participants

**SECTION B;** knowledge/public awareness of antioxidant supplements in preventing oxidative stress-related diseases.

**SECTION C;** perception of antioxidant supplements in preventing oxidative stress-related diseases.

**Pretesting:** A pretest study was done with 10% of study sample size to establish reliability, clarity, inclusion of relevant information and good consistency in the words, they that were not selected to be part of the survey. Modifications was made on the questionnaire based on feedback received from pretest.

**Method of Data Collection:**

The structured questionnaire was used to collect data on public knowledge of antioxidant supplements, as well as their position and conviction, judgment, and methods for reducing oxidative stress disorders. Respondents were contacted and asked where they obtained the antioxidant information. The structured questionnaire was created to be basic and easy to understand. The collection of data was carried out for a period of 2 months. A Research assistant was trained within a month on how to administer consent form, collect, analyze and interpret data. An information sheet, ethics approval and written consent form (which was read out) was provided to each respondent. There was confidentiality and anonymity of data of respondents.

**Data Management**

***Measurement Variables*:** The questionnaire checked the Public awareness and perception of antioxidant supplements in preventing oxidative stress-related diseases

***Statistical Analysis*:** Responses or feedback gotten from survey was transcribed from paper into electronic database using the software Statistical Package for Social Sciences (SPSS) software version 26.0 [SPSS Inc; Chicago, IL, USA] and presented in the form of numerical, tabular presentations. Descriptive statistics were employed to characterize the demographic characteristics of the respondents and their level of awareness. Percentages and frequencies were determined.

**Ethical Considerations:** Ethical approval for the study was obtained from Ministry of Health Research and Ethics Committee Akwa Ibom State. A written informed consent was obtained from the respondents before questionnaires were administered. Information given was treated with utmost confidentiality. There was also provision for translation of consent form for participants who can't read or write.

Before distributing the questionnaire to respondents, demographic information such as educational level, age, gender, and socioeconomic position were assessed. The responders were picked at their discretion, and their confidentiality was maintained.

**Limitation of the study:** Although the goal is to assess public awareness and perception of antioxidant supplements, there are limitations in that self-reporting may be biased, as respondents may overestimate their knowledge and awareness. As a result, future studies might benefit from a bigger representative sample and better inclusion procedures.

**RESULTS:**

One hundred (100) respondents participated in the study and provided responses to all the questions. The results obtained are shown below:

**Table 1: Demographic Characteristics of Respondents**

| **Demographic variable** | **Frequency(n =100** | **Percentage (%)** |
|---|---|---|
| **Age Group** | | |
| | 20 | 20.0 |

| | | |
|---|---|---|
| 18-25 years | | |
| 26-35 years | 25 | 25.0 |
| 36-45 years | 30 | 30.0 |
| 46 years and above | 25 | 25.0 |
| **Gender** | | |
| Male | 45 | 45.0 |
| Female | 55 | 55.0 |
| **Education Level** | | |
| No formal education | 10 | 10.0 |
| Primary education | 25 | 25.0 |
| Secondary education | 35 | 35.0 |
| Tertiary education | 30 | 30.0 |
| **Occupation** | | |
| Student | 20 | 20.0 |
| Employed | 50 | 50.0 |
| Unemployed | 30 | 30.0 |

Their ages ranged from 18-46 years females 55%, Greater percentage, 35%, Majority of the respondents were of the respondents had educational status (Secondary education)

**Table 2: Awareness of Antioxidants among Respondents**

| Awareness Level | Frequency (n) | Percentage (%) |
|---|---|---|
| Aware of Antioxidants | 43 | 43.0 |
| Not Aware of Antioxidants | 57 | 57.0 |
| Misconceptions about Antioxidants | 47 | 47.0 |

| Awareness Level | Frequency (n) | Percentage (%) |
|---|---|---|
| Correct Understanding | 53 | 53.0 |

43% of participants were aware of the possible health advantages of antioxidants. majority of respondents (47%) had false beliefs about the contribution of antioxidants to the prevention of illness.

**Table 3: Attitudes towards Antioxidant Supplementation**

| Attitude Statement | Frequency (n) | Percentage (%) |
|---|---|---|
| Interested in Accurate Health Information | 80 | 80.0 |
| Believe Antioxidant Supplements Prevent Diseases | 65 | 65.0 |
| Skeptical About Efficacy | 35 | 35.0 |

The survey investigated respondents' opinions regarding antioxidant supplementation. Majority of the respondents 80% expressed a desire to obtain more precise health information on antioxidants. while 35% of respondents were doubtful about the effectiveness of antioxidant supplements and 65% of respondents thought they may help prevent illnesses

**Table 4: Sources of Information on Antioxidants**

| Source of Information | Frequency (n) | Percentage (%) |
|---|---|---|
| Professional Health Sources | 37 | 37.0 |
| Non-Professional Sources | 63 | 63.0 |
| Social Media | 40 | 40.0 |
| Friends and Family | 23 | 23.0 |

The findings showed that although just 37% of respondents looked for information from reputable health sources like doctors and dietitians, the majority (63%) relied on non-professional sources

**DISCUSSION**

The study's findings provide vital insights into public understanding and perception of antioxidant supplements in the Abak Local Government Area of Akwa Ibom State, Nigeria. A sizable proportion of respondents (43%) were aware of antioxidants; yet, an alarming 47% had misunderstandings about their function in disease prevention. The modest level of awareness about antioxidants is similar to earlier research, which found various degrees of public understanding about dietary supplements[16] The significant amount of misunderstandings (47%), indicates that many people may not completely comprehend the scientific foundation for antioxidant health claims.

This is per research that illustrates how false information is frequently spread by relying on uncertain sources, such as social media and conversations among peers[23-25]. The majority of facts on antioxidants emanate from non-professional sources (63%) which raises questions about the veracity and integrity of the facts being shared. It is exclusively troubling when people depend on deceptive sources for health facts because this might bring about the proliferation of myths and deception regarding antioxidant supplements. According to earlier studies, those who get their health facts from informal sources are more likely to misunderstand dietary supplements[17-19]. The study's findings highlighted the need for increased health literacy campaigns that emphasize the significance of seeking reliable information on dietary supplements from certified health providers. The survey also found that the vast majority of respondents (80%) wanted more precise health information on antioxidants. Furthermore, 65% of respondents believe antioxidant supplements might help avoid illnesses, indicating a potential market for educational programs aiming at explaining their function in health promotion[28].

There is an obvious need for focused teaching campaigns that dispel myths about antioxidants and give evidence-based information on their efficacy and safety. To reach a larger audience, such programs might be delivered through community workshops, health fairs, and online platforms. Furthermore, healthcare practitioners should be encouraged to engage in talks with patients about dietary supplements, therefore dispelling myths and providing factual information[16] While this study provides useful information, it is important to recognize its limitations.

The use of a convenience sample strategy may reduce the findings' generalizability to the larger population. Future studies should investigate using a more representative sample technique and investigating qualitative methodologies to acquire a better understanding of public views and attitudes about antioxidants. Longitudinal studies might also assist examine changes in knowledge and attitudes over time, especially after educational interventions[12]

## CONCLUSION

This study contributes to the broader discourse on public health nutrition and emphasises the importance of integrating reliable information

into community health initiatives and fostering a better understanding of antioxidants and their role in health, it is possible to mitigate the risks associated with oxidative stress-related diseases and promote overall well-being in the Abak Local Government Area and beyond.

**CONFLICT OF INTEREST:** We hereby declare zero conflict of interest in the study

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