

Original article

Consumer Awareness of the Sugar-Sweetened Beverages Levy and Its Influence on Consumption Patterns in Kwara State, Nigeria

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ABSTRACT

Keywords:
Sugar-Sweetened, Beverages (SSBs), Consumer Awareness, Levy, Public Health, Consumption Habits, Health Implications.

Sugar-sweetened beverages (SSBs) are fuelling a public health crisis worldwide; in Nigeria, rising obesity and diabetes rates point to growing risks to population well-being. This study investigated the relationship between consumer awareness of the sugar-sweetened-beverages-levy and consumption patterns among residents of Kwara State, Nigeria. Using a cross-sectional survey design, data were collected from 900 participants across various demographic groups, focusing on their awareness of the SSB levy and corresponding consumption habits. Results indicated that 427 respondents (47.4%) exhibited high SSB consumption levels, with a significant correlation between consumer awareness and consumption habits ($r(898) = 0.66, p < 0.05$). Demographic factors such as age, education, and income were significant predictors of consumption habits, collectively accounting for 51.1% of the variance in SSB consumption ($R^2 = 0.511$). The findings underscore the importance of enhancing consumer awareness regarding the health implications of SSBs and the objectives of the levy intended to reduce their consumption. While the levy has been instituted, its effectiveness is hindered by insufficient public knowledge, particularly among younger and urban dwellers whose habit is to consume high levels of SSBs. It is recommended that the Nigerian government implement comprehensive public health education campaigns to communicate health risks of SSB intake and the objectives of the levy, with initiatives tailored to cultural contexts and demographic variances to maximise impact.

Introduction

The consumption of sugar-sweetened beverages (SSBs) has emerged as a major public health issue globally, due to its association with obesity, type 2 diabetes, and other non-communicable diseases (NCDs) [1]. In Nigeria, the rising prevalence of these health issues has become a significant concern, with approximately 35% of adults classified as overweight or obese, and the incidence of diabetes steadily increasing, particularly among urban populations [2]. The high consumption of SSBs is a key factor driving these alarming trends. In response to this growing health crisis, the Nigerian government introduced a levy on sugar-sweetened beverages in 2021, aimed at reducing sugar consumption and improving public health outcomes [3]. This levy imposes a tax of 10 Naira on every litre of non-alcoholic and sugar-sweetened carbonated beverages, intending to deter consumers by increasing costs and motivating them to choose healthier alternatives. However, the effectiveness of this policy is contingent upon consumer awareness and understanding of the levy's objectives.

Despite its implementation, evidence suggests that SSB consumption remains high in Nigeria, especially among younger demographics and urban residents [4]. Research from other countries indicates that the success of such fiscal policies in reducing unhealthy consumption is closely linked to public understanding and response to the policy [5]. Studies reveal that cultural contexts influence SSB consumption patterns. Osei-Assibey et al. [6] found that urban consumers tend to view SSBs as modern and appealing, while those in rural areas prefer traditional beverages. This suggests that health interventions should be tailored to these cultural nuances, as rural populations may benefit from initiatives promoting traditional beverage consumption and raising awareness about the health risks of SSBs [7]. Kearns et al. [8] highlight that many individuals underestimate the caloric value of sugary drinks and fail to adjust their overall caloric intake accordingly. Additionally, Zhou et al. [9] conducted a systematic review that established a consistent link between high SSB intake and adverse health outcomes such as type 2 diabetes and metabolic syndrome. Walker, Smith, and Taylor [10] also emphasise the necessity of ongoing public engagement and information dissemination to support health policy. Given the limited research on the SSB levy's impact in Nigeria, this study aims to investigate the relationship between consumer awareness of the levy and actual consumption patterns among residents of Kwara State, Nigeria, and to guide future public health

initiatives aimed at reducing sugar intake.

Research Questions

- What is the level of consumer awareness of the sugar-sweetened beverages levy among residents in Kwara State, Nigeria?
- What is the level of sugar-sweetened beverage consumption habits among residents in Kwara State, Nigeria?

Research Hypotheses

Ho1: There is no significant relationship between consumer awareness of the sugar-sweetened beverages levy and their sugar-sweetened beverages consumption habits among residents in Kwara State, Nigeria.

Ho2: Demographic factors (age, education, income) do not significantly associate with sugar-sweetened beverage consumption habits among residents in Kwara State, Nigeria.

Methods

Study design

This study employed a cross-sectional survey design to examine the relationship between consumer awareness of the SSB levy and consumption habits among adult residents of Kwara State, Nigeria.

Population and sample

The target population consisted of adult consumers of SSBs in Kwara State, estimated at 1,959,323 adults. A stratified random sampling technique was used to ensure representation across key demographic groups. Sample size was calculated using the formula $n = Z^2 \cdot p(1-p)/e^2$ ($Z = 1.96$, $p = 0.5$, $e = 0.05$), yielding $n \approx 834$, rounded up to 900 to account for potential non-responses.

Sampling procedure

- Stratification: Respondents were stratified by geography, age, and income.
- Recruitment: Via online (Google Forms) and offline-assisted data collection for rural areas.
- Random selection: Online links distributed widely, with measures to prevent duplicate responses.

Data collection

A structured questionnaire collected data on demographic characteristics, awareness of the SSB levy, and SSB consumption habits. Field agents assisted rural participants. Real-time quota monitoring ensured proportional representation.

Data analysis

- Descriptive statistics summarised demographic characteristics, awareness levels, and SSB consumption habits.
- Inferential statistics: Pearson's Product Moment Correlation and multiple regression analysis.
- Significance level: $p < 0.05$.

Ethical considerations

Participants provided informed consent. The study ensured confidentiality and anonymity. Ethical approval was obtained from the relevant institutional review board prior to data collection.

Results

As revealed in (Table 1), 240 (26.7%) of participants were aged 18–24 years; 300 (33.3%) aged 25–34; 180 (20.0%) aged 35–44; 120 (13.3%) aged 45–54; and 60 (6.7%) aged 55 and above. Males were 440 (48.9%) and females 460 (51.1%). Education: 300 (33.3%) secondary, 520 (57.8%) tertiary, 80 (8.9%) no formal education. Income: 200 (22.2%) earned below ₦100,000; 300 (33.3%) earned ₦100,000–299,999; 240 (26.7%) earned ₦300,000–499,999; and 160 (17.8%) earned ₦500,000 and above. Geographically, 600 (66.7%) were urban and 300 (33.3%) were rural.

Question One: Level of consumer awareness of the SSB levy

Given that the awareness questionnaire contained 10 items in a four-response format (min=10, max=40, range=30), participants were categorised as high (31–40), moderate (21–30), or low (10–20) awareness. Results are in (Table 2 and Fig. 1).

Table 1. Demographic characteristics of participants (N = 900)

Age	Frequency	Percentage
18–24	240	26.7
25–34	300	33.3
35–44	180	20.0
45–54	120	13.3
55 and above	60	6.7
Gender	Frequency	Percentage
Male	440	48.9
Female	460	51.1
Total	900	100.0
Education	Frequency	Percentage
Secondary	300	33.3
University	520	57.8
No Formal Education	80	8.9
Total	900	100.0
Monthly Income	Frequency	Percentage
Below ₦100,000	200	22.2
₦100,000 – ₦299,999	300	33.3
₦300,000 – ₦499,999	240	26.7
₦500,000 and above	160	17.8
Total	900	100.0
Geographic Location	Frequency	Percentage
Urban	600	66.7
Rural	300	33.3
Total	900	100.0

Table 2 shows that 218 (24.2%) of participants had high awareness, 384 (42.7%) moderate, and 298 (33.1%) low. Thus, the overall level of consumer awareness of the SSB levy was moderate.

Table 2. Level of consumer awareness of the SSB levy, Kwara State, Nigeria

Awareness of SSB Levy	Score Range	Frequency	Percentage
High	31–40	218	24.2
Moderate	21–30	384	42.7
Low	10–20	298	33.1
Total		900	100.0

Question Two: Level of SSB consumption habits

The consumption-habits questionnaire contained 5 items (min=5, max=20, range=15). Participants were categorised as high (16–20), moderate (11–15), or low (5–10). Results are in (Table 3 and Fig. 2).

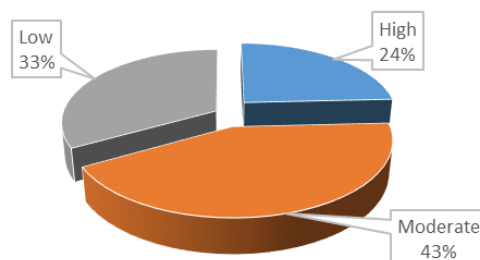


Figure 1: Consumer awareness of the sugar-sweetened beverages levy in Kwara State, Nigeria

Fig. 1. Consumer awareness of the sugar-sweetened beverages levy in Kwara State, Nigeria

Table 3 indicates that 427 (47.4%) had high SSB consumption; 262 (29.1%) moderate; and 211 (23.5%) low. Thus, SSB consumption habits in Kwara State were high.

Table 3. Level of SSB consumption habits among residents, Kwara State, Nigeria

SSB Consumption Habits	Score Range	Frequency	Percentage
High	16–20	427	47.4
Moderate	11–15	262	29.1
Low	5–10	211	23.5
Total		900	100.0

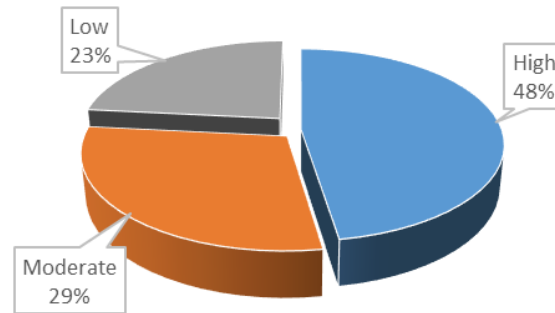


Figure 2: consumption habit of sugar-sweetened beverages

Fig. 2. Consumption habit of sugar-sweetened beverages among residents in Kwara State, Nigeria

Hypotheses Testing

Hypotheses were tested using Pearson’s Product-Moment Correlation (PPMC) and regression analysis at the 0.05 alpha level.

Hypothesis One

Table 4 shows $r\text{-cal} = 0.66$, $p = 0.000$ at $\alpha = 0.05$. Since $p < 0.05$, H_0 is rejected. There is a significant relationship between consumer awareness of the SSB levy and consumption habits ($r(898) = 0.66$, $p < 0.05$).

Table 4. Pearson product-moment correlation between SSB levy awareness and consumption habits

Sugar-Sweetened Beverages	No	Mean	S.D	df	r-cal	Sig
Consumers’ awareness	900	28.30	6.74			
				898	0.66	0.000
Consumption habits	900	16.36	4.13			

$p < 0.05$

Hypothesis Two

Table 5a shows that demographic factors contributed $R^2 = 0.511$, accounting for 51.1% of overall variance in SSB consumption habits in Kwara State.

Table 5a. Regression model summary — demographic factors and SSB consumption habits

Model	R	R Square	Adjusted R Square	Std. Error
1	.443 ^a	.511	.314	5.143

a. Predictors: (Constant), demographic factors (age, gender, education, income, location)

Table 5b shows $F(5, 444) = 8.311$, $p = 0.002$. Since $p < 0.05$, H_0 is rejected. Demographic factors are significantly associated with SSB consumption habits in Kwara State.

Table 5b. ANOVA — demographic factors and SSB consumption habits (SS=Sum of Squares; MS=Mean Square)

Mdl		SS	df	MS	F	Sig.	Remark
1	Regression	836.346	5	167.269	8.311	.002 ^b	Rejected
	Residual	8936.348	444	20.127			
	Total	9772.694	449				

a. Dependent Variable: SSB consumption habits b. Predictors: (Constant), demographic data

Table 5c shows that age, education, and income were significant predictors ($p < 0.05$); gender and location were not significant ($p > 0.05$). All factors were positively associated with SSB consumption habits except education, which was negatively associated (-0.186).

Table 5c. Relative contributions of demographic factors to SSB consumption habits

Mdl	Predictor	B	Std. Error	Beta	T	Sig.
1	(Constant)	23.922	1.287		12.722	.000
	Age	.149	.836	.168	4.791	.000
	Gender	.126	.729	.077	4.218	.065
	Education	-.091	.628	-.186	2.387	.000
	Income	.133	.711	.217	4.583	.000
	Location	.086	.593	.094	3.247	.071

Dependent Variable: SSB consumption habits. Unstandardized (B, Std. Error) and Standardized (Beta) coefficients shown.

Discussion

This study illuminates Kwara State consumers' SSB awareness and consumption behaviours across 900 participants, finding substantial associations between demographic characteristics and SSB consumer awareness and use. A large proportion of younger consumers, notably in the 25–34 age group (33.3%), participated. Wang et al. [11] revealed that this group consumed the most SSBs, citing taste preferences and marketing targeting. Social media promotions integrate SSBs into young people's daily lives [12]. According to Ng et al. [13], younger people drink SSBs in social settings because they are trendy and fun, reinforcing consumption behaviours. The urban-rural divide (600 urban, 66.7%) supports literature linking urban areas to increased SSB use. Lee et al. [14] revealed that urban consumers had increased access to SSBs due to more retail outlets, while Smith et al. [15] found that lifestyle factors and aggressive marketing drive urban SSB consumption.

Urban consumers may also have more disposable income and spend more on SSBs [15]. Consumer awareness of the SSB levy was moderate (384, 42.7%). Thompson et al. [12] found that health policy awareness substantially reduces unhealthy food and beverage consumption. Choi et al. [16] showed that knowledge of food taxes decreased purchase intentions and consumption. Martinez et al. [17] found that educational interventions raise consumer awareness of dietary policies. Ahmed et al. [18] found that younger and more educated people were more knowledgeable about health policies. That 427 respondents (47.4%) consumed high SSBs is concerning given associated health risks [13]. Popkin et al. [19] found rising SSB intake in developing nations, with many people unaware of health hazards. Hu et al. [20] observed SSB consumption skyrocketing in low- and middle-income nations where marketing exploits consumer ignorance. A significant correlation ($r(898) = 0.66, p < 0.05$) exists between SSB levy awareness and consumption habits. Mason et al. [21] found that SSB awareness programmes reduced intake. Bleich et al. [22] found that educating SSB consumers about health dangers reduced consumption. Gollust et al. [23] showed that culturally relevant messaging improves awareness and dietary choices. Hsieh et al. [24] confirmed that awareness of health policies reduces intake of harmful beverages. Moore et al. [25] noted that effective awareness efforts must combine education with practical assistance.

The second hypothesis analysis found that demographic factors explained 51.1% of the variance in SSB consumption ($R^2 = 0.511$). Smith et al. [26] confirmed that demographics strongly influence dietary choices, particularly SSB use. Almiron-Roig et al. [27] revealed that income strongly predicts SSB consumption. Torres et al. [28] found higher education linked to decreased SSB consumption. Kuo et al. [29] found gender differences in SSB consumption, though the current study found gender differences to be non-significant. Alshahrani et al. [30] revealed urban-rural differences in SSB consumption due to availability and marketing. Beta-weight analysis identified age, education, and income as important predictors, with education negatively associated (-0.186). Thompson et al. [12] and Hu et al. [31] both emphasise education's role in health literacy and dietary choices. Lim et al. [32] confirmed that younger people consume more SSBs. Rojas et al. [33] confirmed that lower-income people consume more SSBs due to limited access to healthier food. The lack of significance for gender and location suggests these variables may be less influential locally, warranting further research.

Conclusion

This study provides important insights into SSB consumption habits among residents of Kwara State, Nigeria. Consumer awareness of the SSB levy significantly affects consumption behaviour. Demographic characteristics such as age, education, and income also affect SSB intake, with education negatively associated with high consumption. These findings support the need for targeted interventions to address rising SSB intake, especially given its link to obesity and diabetes. Public health campaigns should focus on individuals with lower education levels to increase awareness. The positive association of income with consumption highlights the need for complementary measures, such as subsidies for healthier

alternatives. Future research should evaluate the long-term impact of the SSB levy across different population segments.

Recommendations

1. Given the moderate understanding of the sugar-sweetened beverages levy, public awareness activities must be intensified. These campaigns should inform consumers about the health dangers of SSBs and the benefits of lowering intake. Using social media, community seminars, and school initiatives can expand your audience.
2. School curricula should include nutrition education to promote healthy habits early on. Health literacy and diet education can be improved by adult programs, especially in low-income communities.
3. Policymakers should consider restricting SSB marketing, especially to children and adolescents. It may include limitations on school and public advertising and clear labeling of products that highlight sugar levels and health dangers.
4. Health groups and local governments should work together to promote healthy eating. This could include cooking lessons, community gardens, and fitness programs that encourage better SSB alternatives.
5. Continuously monitoring SSB consumption patterns and awareness campaign success is crucial. These efforts' long-term effects on consumption patterns and health outcomes should be studied to inform strategy changes.

Authors' Contributions

KAJ conceived and designed the study, supervised data collection, and drafted the manuscript. KAU contributed to data collection, analysis, editing, and review. AOO contributed to data collection, analysis, and review. AAO contributed to the literature review and editing. AAJ contributed to the conceptual framing and critical review. AKJ contributed to data analysis and review. All authors read and approved the final version and agree to be accountable for all aspects of the work.

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Conflicts of Interest

The authors declare no conflicts of interest.

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