

Access to Accurate Cosmetic Information and Its Effect on the Prevalence of Adverse Cosmetic Events in Abuja, Nigeria

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ABSTRACT

Background: The widespread use of cosmetic products, particularly skin-lightening preparations, in Nigeria has raised significant public health concerns due to adverse cosmetic events (ACE) linked to inadequate labelling, misleading advertising, and weak regulatory enforcement by the National Agency for Food and Drug Administration and Control (NAFDAC).

Objective: This study assessed access to accurate cosmetic information and its impact on the prevalence of ACE in Abuja, Nigeria.

Methods: A cross-sectional mixed-methods study was conducted among 434 cosmetic consumers in the Federal Capital Territory (FCT). Data were collected using structured questionnaires and analysed using descriptive statistics and chi-square tests. Additionally, 12 Key Informant Interviews (KIIs) were conducted with regulators, manufacturers, retailers, and healthcare providers, and analysed using thematic analysis. A compliance assessment was conducted on 60 cosmetic products across five categories.

Results: Consumer trust in cosmetic labelling was low, with only 37.7% agreeing that ingredient lists are accurate and 37.9% trusting advertising claims. Although 47.8% reported understanding product labels, 79.5% were unable to identify harmful ingredients. The prevalence of ACE was high at 69.6% and was significantly associated with sex ($p < 0.001$), marital status ($p = 0.032$), religion ($p < 0.001$), employment status ($p = 0.035$), and income ($p < 0.001$). Compliance assessment revealed wide variation across product categories: oral care products demonstrated high compliance (91.7%), skin and hair care were moderately compliant (70.8% each), nail care showed low compliance (54.2%), and fragrances/perfumes demonstrated very poor compliance (33.3%). Qualitative findings revealed persistent labelling gaps, exaggerated marketing claims, informal market repackaging practices, and enforcement limitations.

Conclusion: Inadequate labelling, deceptive advertising, and regulatory weaknesses significantly contribute to the high prevalence of ACE, underscoring the need for strengthened enforcement and improved consumer education. Future longitudinal and product-specific studies are recommended to inform sustained policy interventions.

Keywords

Adverse cosmetic events, Cosmetic labelling, NAFDAC, Consumer safety, Skin-lightening, Nigeria, Federal Capital Territory.

Introduction

The cosmetic industry has experienced exponential growth over

the past few decades, with an increasing number of individuals seeking cosmetic products for various purposes, ranging from aesthetic enhancement to medical necessity. Recent surveys reveal that the average adult uses nine personal care products each day, incorporating up to 126 unique chemical ingredients [1]. The global cosmetics market was valued at USD 374.18 billion in 2023

and is projected to reach USD 758.05 billion by 2032, exhibiting a compound annual growth rate of 9.8% [2].

There has been growing concern regarding the prevalence of adverse events associated with cosmetic use. These adverse events range from minor complications to severe outcomes, impacting the physical, psychological, and social well-being of individuals. The prevalence of cosmetic-induced adverse events was found to be 33% in a study conducted in India, with the most commonly reported events being itching, redness, and pimples [3]. In Tanzania, 91% of respondents reported using cosmetic products, and 58.4% admitted to having experienced at least one adverse reaction, including allergic reactions (30.8%) and burning sensations (18.5%) [4]. A study in Ibadan, Nigeria, reported that 21.3% of cosmetic users experienced adverse effects, with usage being highest among females aged 21 to 25 years [5].

According to the European Union, a cosmetic product is defined as any substance or preparation intended to be placed in contact with the external parts of the human body, or with the teeth and mucous membranes of the oral cavity, for purposes including cleaning, perfuming, changing appearance, correcting body odours, or maintaining good condition [6]. According to the Food and Drug Administration of the Philippines, adverse cosmetic events (ACE) refer to any genuine, harmful, or unintended event reasonably attributable to the normal or foreseeable use of a given cosmetic product [7]. Adverse reactions to cosmetics constitute a significant number of contact dermatitis cases and may present as allergic contact dermatitis, photodermatitis, irritant contact dermatitis, contact urticaria, hypo- or hyperpigmentation, and hair and nail damage [8].

Access to accurate information plays a crucial role in shaping individuals' perceptions, behaviours, and decision-making, particularly in health-related matters. Many consumers are unaware of the potential risks associated with cosmetic products or how to report adverse reactions [9]. Cosmetic product labelling and advertising serve as the primary tools for information transmission to consumers, and regulatory frameworks such as NAFDAC's Cosmetics Products Labelling Regulations [10] and Cosmetics Products Advertisement Regulations [11] exist to govern these practices in Nigeria.

In the Federal Capital Territory (FCT), Nigeria's administrative capital, the cosmetics market is vibrant and diverse, catering to heterogeneous consumer preferences. However, the proliferation of cosmetic products is accompanied by the risk of ACE, which can adversely impact public health. Understanding the role of accurate information in mitigating ACE prevalence is essential for informing evidence-based interventions, regulatory policies, and consumer education initiatives.

This study investigated the relationship between access to accurate cosmetic product information and the prevalence of ACE in the FCT, Abuja. Specifically, it examined consumer awareness and

comprehension of cosmetic labels and advertisements, the level of regulatory compliance of cosmetic products with labelling standards, and demographic factors associated with ACE. By shedding light on information gaps and challenges faced by consumers and regulatory stakeholders, this study aims to inform strategies for enhancing consumer safety and public health awareness in Nigeria's cosmetic industry.

Methods

Study Design

A cross-sectional mixed-methods research design was adopted. The quantitative component involved a structured consumer survey and a product compliance assessment, while the qualitative component consisted of Key Informant Interviews (KIIs) with relevant stakeholders.

Study Setting

The study was conducted in the Federal Capital Territory (FCT), Abuja, Nigeria. The FCT is centrally located, bordered by Niger, Kaduna, Nasarawa, and Kogi States, and covers approximately 7,315 km² within the savannah zone. It comprises six Area Councils: Abuja Municipal Area Council (AMAC), Bwari, Gwagwalada, Kuje, Abaji, and Kwali. Since becoming Nigeria's capital in 1976, Abuja has experienced rapid urban and commercial growth, and its heterogeneous population significantly influences cosmetic consumption patterns.

Study Population and Sampling

The target population comprised cosmetic consumers and selected regulatory stakeholders in the FCT. Consumers included teenagers aged 15 to 17 years and adults aged 18 years and above who actively use cosmetic products. Using Slovin's formula with a FCT adult population estimate of 2,139,412 and a margin of error of 5%, the minimum sample size was calculated as 400, adjusted to 442 to accommodate a 10% non-response rate.

A multistage sampling technique was employed. In the first stage, two of the six area councils (AMAC and Bwari) were randomly selected. In the second stage, five major locations per council were identified, and four locations were randomly selected. In the third stage, four public places (Bwari Market, Dutse Market, Eagle Square, and Banex Plaza) were randomly selected from ten identified sites. Eligible consumers at each site were recruited consecutively until the allocated sample size per site was achieved.

For the compliance assessment, 60 cosmetic products were randomly selected across the four clusters and five product categories: skin care, oral care, hair care, nail care, and fragrances/perfumes. Products were sourced from both formal outlets (supermarkets, cosmetic shops) and informal retail settings (open-market stalls) to ensure representative sampling.

Twelve key informants were purposively selected from four stakeholder groups: regulatory officers (n = 3), cosmetic manufacturers/importers (n = 3), cosmetic retailers (n = 3), and

healthcare providers including dermatologists and pharmacists (n = 3).

Inclusion and Exclusion Criteria

Inclusion criteria for the consumer survey were: residency in the FCT, age 15 years and above, and voluntary provision of informed consent. For the quantitative component, individuals directly involved in the manufacture, importation, or large-scale distribution of cosmetic products were excluded to minimise response bias. Such stakeholders were, however, purposively included in the qualitative component as key informants.

Data Collection

Consumer survey data were collected using a structured questionnaire administered electronically via Google Forms, with links converted to QR codes for scanning at study sites. The questionnaire assessed respondents' access to cosmetic information, product usage patterns, experiences of ACE, perceptions of cosmetic safety, and views on regulatory compliance.

KIIs were conducted using a semi-structured guide exploring perspectives on labelling practices, advertising standards, regulatory enforcement, and consumer information gaps. Interviews were conducted face-to-face or by telephone, audio-recorded with participant consent, and transcribed verbatim using TurboScribe web-based software.

Product compliance was assessed using a standardised Cosmetics Product Labelling and Safety Compliance Checklist based on NAFDAC guidelines, EU Cosmetic Regulation 1223/2009, and FDA labelling standards. The checklist comprised 12 items across five domains: label information (questions 1–3), ingredient disclosure (questions 4–5), safety information (questions 6–7, 9–10), claims and advertisement (questions 8 and 11), and restricted ingredient compliance (question 12). Each item was rated as Yes (2 points), Partial (1 point), or No (0 points), yielding a maximum score of 24 per product category.

Data Analysis

Quantitative data were analysed using descriptive statistics (frequencies, percentages, and means) and inferential statistics. Chi-square tests were used to determine associations between ACE and demographic variables, and between ACE and access to accurate product information. Statistical significance was set at $p < 0.05$.

Product compliance data were analysed by computing a Compliance Index (%) for each category using the formula: Compliance Index (%) = (Total Score Obtained / Maximum Possible Score) $\times$ 100. Compliance levels were categorised as high ($\geq 90\%$), moderate (70–89%), or low ($< 70\%$).

Qualitative data from the KIIs were analysed using thematic analysis, involving systematic reading, coding, pattern identification, and theme development. Qualitative findings were

then triangulated with quantitative results for contextual depth and validation.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board (IRB) of Bingham University. The study complied with the principles of the Declaration of Helsinki and the guidelines of the International Conference on Harmonisation of Good Clinical Practice (ICH-GCP). All participants provided informed consent prior to data collection, and confidentiality of data was maintained throughout the study.

Results

Response Rate and Participant Demographics

Of 442 questionnaires administered, 8 participants (1.8%) declined to participate and 9 (2.0%) did not provide consent, yielding an overall response rate of 96.2%. Data from 425 participants were included in the final analysis. The majority of respondents were female (58.6%) and aged between 21 and 40 years (77.4%). Most participants held an OND, HND, or bachelor's degree (63.8%), were single (55.8%), identified as Christian (73.4%), and were either employed (42.8%) or self-employed (39.5%). Monthly income varied: 24.7% earned between ₦71,000 and ₦200,000, 23.8% earned ₦201,000 to ₦400,000, and 18.1% earned below ₦70,000. Table 1 presents the full demographic distribution.

Table 1: Demographic Characteristics of Study Participants (N = 425).

Characteristic	Frequency	Percentage (%)
Sex		
Female	249	58.6
Male	176	41.4
Age category (years)		
15–20	23	5.4
21–30	170	40.0
31–40	159	37.4
41–50	48	11.3
51–60	22	5.2
> 60	3	0.7
Educational level		
FSLC	23	5.4
WASSCE/NECO/SSCE	45	10.6
OND/HND/BSc	271	63.8
PDG/MSc/PhD	86	20.2
Marital status		
Single	237	55.8
Married	175	41.2
Divorced	7	1.6
Widowed	6	1.4
Employment status		
Employed	182	42.8
Self-employed	168	39.5
Unemployed	50	11.8
Student	25	5.9

Table 2: Consumer Awareness, Comprehension, and Interpretation of Cosmetic Labels and Advertisements.

Item	SD n(%)	D n(%)	UD n(%)	A n(%)	SA n(%)	Mean ± SD
Understand label information	29(6.8)	175(41.2)	18(4.2)	127(29.9)	76(17.9)	3.11±1.30
Identify harmful ingredients	120(28.2)	218(51.3)	22(5.2)	56(13.2)	9(2.1)	2.10±1.02
Label clarity influences trust	4(0.9)	34(8.0)	35(8.2)	175(41.2)	177(41.6)	4.15±0.94
Accurate info increases satisfaction	5(1.2)	19(4.5)	17(4.0)	164(38.6)	220(51.8)	4.35±0.85
Prefer brands with truthful info	6(1.4)	17(4.0)	11(2.6)	149(35.1)	242(56.9)	4.42±0.84

SD = Strongly Disagree; D = Disagree; UD = Undecided; A = Agree; SA = Strongly Agree.

Consumer Awareness and Comprehension of Cosmetic Labels and Advertisements

Consumer awareness and interpretation of cosmetic product labels and advertisements were assessed across multiple dimensions. Regarding label comprehension, 47.8% of respondents agreed or strongly agreed that they understand label information (mean = 3.11 ± 1.30), while a notable proportion (48.0%) disagreed. However, a significant knowledge gap was identified in ingredient risk identification: 79.5% of respondents disagreed or strongly disagreed that they could identify harmful ingredients on cosmetic labels (mean = 2.10 ± 1.02).

The clarity of labelling and advertising was reported to strongly influence consumer trust, with 82.8% of respondents agreeing or strongly agreeing with this relationship (mean = 4.15 ± 0.94). Accurate cosmetic information was perceived as increasing product satisfaction by 90.4% of respondents (mean = 4.35 ± 0.85), and 92.0% stated they were more likely to purchase from brands providing clear and truthful information (mean = 4.42 ± 0.84). Table 2 summarises these findings.

Regulatory Compliance of Cosmetic Products

The compliance assessment of 60 cosmetic products across five categories revealed significant variation in adherence to labelling and safety regulations (Tables 3 to 7 and summarised in Table 8). Oral care products achieved the highest Compliance Index of 91.7%, reflecting comprehensive fulfilment of all key domains including ingredient disclosure, safety statements, and accurate claims. Skin care and hair care products both achieved a moderate Compliance Index of 70.8%, demonstrating adequate labelling in basic safety areas but with gaps in ingredient disclosure and claim substantiation. Nail care products recorded a low Compliance Index of 54.2%, with critical deficiencies in active ingredient declaration, allergen disclosure, and safety communication. Fragrances and perfumes demonstrated the poorest compliance, achieving a Compliance Index of only 33.3%, with near-absent manufacturer details, safety instructions, allergen information, and substantiated claims.

Table 3: Compliance Index for Skin Care Products.

S/N	Compliance Parameter	Status	Score
1	Product name clear and reflects actual use	Yes	2
2	Manufacturer name, address, country included	Partial	1
3	Batch number, manufacturing and expiry dates legible	Yes	2
4	Full ingredient list in descending order	Partial	1

5	Active ingredients and concentrations stated	Partial	1
6	Cautionary statements and safety warnings provided	Yes	2
7	Directions for safe and proper use included	Yes	2
8	Claims realistic and scientifically substantiated	Partial	1
9	Allergens/sensitive ingredients disclosed	Partial	1
10	Storage and disposal instructions included	No	0
11	Advertisement consistent with product label	Yes	2
12	Product complies with permissible ingredient limits	Yes	2
Total			17/24 (70.8%)

Table 4: Compliance Index for Oral Care Products.

S/N	Compliance Parameter	Status	Score
1	Product name clear and functional	Yes	2
2	Manufacturer details complete	Yes	2
3	Batch and expiry dates legible	Yes	2
4	Ingredients declared properly	Yes	2
5	Active ingredients and concentrations stated	Yes	2
6	Cautionary/safety statements included	Yes	2
7	Directions for use provided	Yes	2
8	Claims realistic and verified	Yes	2
9	Allergens disclosed	Partial	1
10	Storage/disposal instructions included	Partial	1
11	Advertisement matches product label	Yes	2
12	Compliance with restricted ingredient limits	Yes	2
Total			22/24 (91.7%)

Table 5: Compliance Index for Hair Care Products.

S/N	Compliance Parameter	Status	Score
1	Product name clear and functional	Yes	2
2	Manufacturer details complete	Partial	1
3	Batch and expiry details legible	Yes	2
4	Ingredients declared in correct order	Partial	1
5	Active ingredients stated	Partial	1
6	Cautionary/safety information provided	Yes	2
7	Directions for use stated	Yes	2
8	Claims realistic and supported	Partial	1
9	Allergens disclosed	No	0
10	Storage/disposal instructions included	Partial	1
11	Advertisement consistent with label	Yes	2
12	Compliance with restricted ingredient limits	Yes	2
Total			17/24 (70.8%)

Table 6: Compliance Index for Nail Care Products.

S/N	Compliance Parameter	Status	Score
1	Product name clear	Yes	2
2	Manufacturer information provided	Partial	1
3	Batch/expiry information legible	Yes	2
4	Ingredient list complete	Partial	1
5	Active ingredients stated	No	0
6	Safety/cautionary statements included	Partial	1
7	Directions for use given	Yes	2
8	Claims scientifically supported	Partial	1
9	Allergens disclosed	No	0
10	Storage/disposal instructions included	No	0
11	Advertisement consistent with label	Partial	1
12	Compliance with restricted ingredient limits	Yes	2
Total			13/24 (54.2%)

Table 7: Compliance Index for Fragrances and Perfumes.

S/N	Compliance Parameter	Status	Score
1	Product name clear	Yes	2
2	Manufacturer details included	No	0
3	Batch and expiry details legible	Partial	1
4	Ingredient list declared	Partial	1
5	Active ingredients stated	No	0
6	Safety/cautionary statements provided	Partial	1
7	Directions for use stated	No	0
8	Claims realistic and verified	No	0
9	Allergens disclosed	No	0
10	Storage/disposal instructions included	No	0
11	Advertisement consistent with label	Partial	1
12	Compliance with restricted ingredient limits	Yes	2
Total			8/24 (33.3%)

Table 8: Summary of Compliance Index by Product Category.

Product Category	Total Score	Compliance Index (%)	Compliance Level
Skin care	17/24	70.8%	Moderate
Oral care	22/24	91.7%	High
Hair care	17/24	70.8%	Moderate
Nail care	13/24	54.2%	Low
Fragrances & Perfumes	8/24	33.3%	Low

Association between Access to Accurate Information and ACE

The overall prevalence of ACE among study participants was 69.6%. Of the 425 participants, 74.4% had no access to accurate/complete cosmetic product information, while 25.6% did. The prevalence of ACE was higher among those without access to accurate information (71.8%) compared to those with access (63.3%). Chi-square analysis found no statistically significant association between access to accurate product information and ACE occurrence ($\chi^2 = 2.791$, $p = 0.095$), though the direction of the relationship was consistent with the hypothesised protective effect of accurate information. Table 9 presents these findings.

Table 9: Association between ACE and Access to Accurate Cosmetic Product Information.

Access to Information	Frequency	No. with ACE (%)	χ^2	p value
No	316	227 (71.8%)	2.791	0.095
Yes	109	69 (63.3%)		

Association between Demographic Characteristics and ACE

Chi-square analysis revealed statistically significant associations between ACE and several demographic variables. Females reported a significantly higher ACE prevalence (77.5%) compared to males (55.7%) ($\chi^2 = 28.459$, $p < 0.001$). Marital status was significantly associated with ACE, with married respondents reporting the highest prevalence (86.3%) compared to single (56.7%), divorced (42.8%), and widowed (33.3%) respondents ($\chi^2 = 22.501$, $p = 0.032$). Religion was also significantly associated with ACE ($\chi^2 = 36.712$, $p < 0.001$), with Christians reporting the highest prevalence (74.7%) compared to Muslims (51.9%). Employment status ($\chi^2 = 22.221$, $p = 0.035$) and income level ($\chi^2 = 52.040$, $p < 0.001$) were also significantly associated with ACE. In contrast, age category ($\chi^2 = 23.657$, $p = 0.258$) and educational level ($\chi^2 = 15.572$, $p = 0.212$) were not significantly associated with ACE. Table 10 presents the full results.

Table 10: Association between Demographic Characteristics and ACE.

Characteristic	Frequency	ACE n (%)	χ^2	p value
Sex				
Female	249	190 (77.5)	28.459	< 0.001
Male	176	98 (55.7)		
Age category (years)				
15–20	23	18 (78.2)	23.657	0.258
21–30	170	126 (74.1)		
31–40	159	101 (63.5)		
41–50	48	29 (60.4)		
51–60	22	9 (40.9)		
> 60	3	2 (66.7)		
Educational level				
FSLC	23	16 (69.5)	15.572	0.212
WASSCE/NECO/SSCE	45	31 (68.9)		
OND/HND/BSc	271	179 (66.1)		
PDG/MSc/PhD	86	59 (68.6)		
Marital status				
Single	237	132 (56.7)	22.501	0.032
Married	175	151 (86.3)		
Divorced	7	3 (42.8)		
Widowed	6	2 (33.3)		
Religion				
Christianity	312	233 (74.7)	36.712	< 0.001
Islam	106	55 (51.9)		
Other	7	0 (0.0)		

Qualitative Findings

Thematic analysis of the 12 KIIs identified four major themes: (i) weak regulatory compliance among cosmetic manufacturers and retailers; (ii) limited availability of accurate consumer information; (iii) poor enforcement of labelling and advertising

standards; and (iv) adverse health outcomes attributable to poor cosmetic information.

Regulatory officers confirmed widespread non-compliance, particularly among small importers and informal retailers who bypass formal registration channels. Products frequently omitted expiry dates, carried incomplete ingredient lists, or used foreign-language-only labelling. Retailers in open markets were found to repackage bulk products into unlabelled containers, eliminating all traceability for consumers. Manufacturers/importers acknowledged that the cost of full regulatory compliance deters smaller operators, contributing to a two-tier market where large companies maintain compliance while informal operators do not.

Healthcare providers reported recurring adverse cases involving products with undisclosed high-potency ingredients, including corticosteroids and mercury derivatives, without label disclosure. In the absence of complete ingredient information, clinicians were unable to identify causative agents rapidly, leading to delayed and suboptimal treatment. Consumer information channels—predominantly social media platforms (Instagram, Facebook, TikTok), local radio, and market posters—frequently carried exaggerated or unverified claims such as 'instant whitening' or 'permanent cure for eczema', further compromising informed consumer choice.

Stakeholders consistently called for stronger regulatory enforcement, improved laboratory capacity, cross-agency collaboration, and targeted consumer education campaigns to address these challenges.

Discussion

This study examined the relationship between access to accurate cosmetic product information and the prevalence of ACE in Nigeria's FCT. The findings reveal a complex landscape characterised by widespread labelling deficiencies, low consumer information literacy, and high ACE prevalence, driven by weak regulatory enforcement and culturally embedded cosmetic use practices.

Accuracy and Regulatory Compliance of Cosmetic Information

The study revealed significant deficiencies in the accuracy, completeness, and regulatory compliance of cosmetic product labels and advertisements. Only 37.7% of respondents agreed that ingredient lists are accurate and complete, and only 37.9% trusted advertising claims. These findings align with reports of widespread mislabelling in informal cosmetic markets across sub-Saharan Africa, including incomplete ingredient disclosure for high-risk substances such as hydroquinone and corticosteroids [12,13]. Across the continent, inadequate labelling of skin-lightening products has been identified as a major contributor to adverse skin reactions [14]. The low trust in advertising claims reflects broader evidence that exaggerated and unsubstantiated claims in Nigerian cosmetic advertisements mislead consumers about product safety and efficacy [15].

The concept of information asymmetry is highly relevant here [16], as manufacturers possess significantly more knowledge about product formulations than consumers, creating vulnerability to deceptive marketing. This is compounded by low regulatory compliance, with only 39.1% agreeing that producers comply with labelling regulations. Regulatory personnel interviewed in this study acknowledged challenges including limited manpower, inadequate laboratory capacity, and the influx of counterfeit products, consistent with documented difficulties in monitoring Nigeria's informal cosmetic markets [17,18]. Similar patterns of smuggled cosmetics undermining regulatory efforts have been reported across East Africa [19].

Consumer Awareness and Label Comprehension

While 47.8% of respondents reported understanding product labels, only 13.2% could identify harmful cosmetic ingredients—a finding underscored by the mean score of 2.10 ± 1.02 . This aligns with evidence that Nigerian consumers, including those with higher education, struggle to interpret complex ingredient lists due to technical terminology and low chemical literacy [25]. Healthcare providers interviewed in this study similarly noted that most patients cannot identify allergens such as parabens or corticosteroids until adverse reactions occur [26].

Consumer trust, satisfaction, and purchasing behaviour were all strongly linked to label clarity and information accuracy, with mean scores of 4.15, 4.35, and 4.42, respectively. These findings are consistent with the Theory of Planned Behaviour [27], which posits that clear, accessible information enhances perceived behavioural control and fosters trust and consumer loyalty. Transparent labelling has been shown to increase consumer confidence in Nigerian cosmetic products [28]. However, complex label designs and small print—highlighted by both pharmacists and retailers in this study—continue to deter engagement, particularly among low-literacy groups [29]. Cultural influences, including beauty standards favouring lighter skin, were reported by 50.8% of respondents as shaping cosmetic choices, consistent with Social Norm Theory [30] and documented trends across Africa linking cultural beauty norms to increased risky cosmetic use [31].

Prevalence of Adverse Cosmetic Events and Demographic Associations

The overall prevalence of ACE in this study was 69.6%, reflecting a high burden of cosmetic-related health harms. This figure is consistent with reported ACE rates in the region; in Lagos, for example, 50% of skin-lightening product users have been reported to experience complications such as dermatitis and ochronosis [32]. The high ACE burden is attributable to a combination of product-level risks—including synthetic compounds such as hydroquinone and mercury as well as heavy metals such as lead and arsenic introduced during manufacture—and consumer-level factors including biological variability and culturally driven product use behaviours [33].

Although no statistically significant association was observed

between access to accurate cosmetic product information and ACE ($\chi^2 = 2.791$, $p = 0.095$), the directional difference—ACE prevalence of 71.8% in those without access vs. 63.3% in those with access—suggests a practical protective relationship. The absence of statistical significance may reflect the overriding influence of deceptive marketing, which undermined the protective role of available information [34]. These results align with the Health Belief Model, which posits that access to accurate information increases perceived benefits of safe product use and reduces barriers to avoiding harmful products [35]. Respondents overwhelmingly believed that better labelling (92%) and clearer product information (92%) could prevent ACE, supporting evidence that transparent labelling helps counter deceptive marketing practices [36].

The strongest demographic association was observed for sex, with females showing significantly higher ACE prevalence (77.5%) compared to males (55.7%) ($p < 0.001$). This is consistent with findings that women in Nigeria are more susceptible to cosmetic-related dermatitis, driven by higher cosmetic use frequency and societal appearance expectations [37]. Marital status, religion, employment, and income were also significantly associated with ACE ($p < 0.05$), reflecting the interplay of social expectations, cultural norms, and purchasing capacity in shaping cosmetic use and risk. The non-significant association with educational level ($p = 0.212$) suggests that misleading labelling continues to undermine the protective role of formal education, as evidenced by similar findings elsewhere in the literature [38].

Compliance Assessment by Product Category

The compliance assessment demonstrated a marked gradient in regulatory adherence across product categories. Oral care products achieved the highest compliance (91.7%), likely attributable to the quasi-medicinal nature of oral products and the stricter regulatory scrutiny they attract due to ingestion risks. Skin care and hair care products showed moderate compliance (70.8% each), with strengths in basic labelling but gaps in ingredient disclosure and claim substantiation. Nail care products (54.2%) and fragrances/perfumes (33.3%) demonstrated the weakest compliance, reflecting high proportions of imported, unregistered, and informally traded products that bypass standard regulatory checks. The dominance of counterfeit and repackaged perfume brands in local markets has been identified in the literature as a significant challenge to consumer safety and product accountability.

Factors Influencing Access to Accurate Information

Over half of respondents (57.2%) reported difficulty accessing accurate cosmetic information, consistent with the information asymmetry framework in which manufacturers' proprietary concerns and packaging space constraints limit disclosure [33]. An overwhelming majority (92.2%) called for stronger regulatory involvement, consistent with the institutional theory which posits that regulatory pressure drives transparent practices [34]. While many respondents (57.2%) did not identify socioeconomic factors as barriers, a significant minority (28.2%) did—suggesting that disparities in informational access persist, particularly for low-

income consumers purchasing unregulated products [35]. Cultural influences and the demand for manufacturer transparency further underscore the need for multifaceted, socially sensitive information strategies in Nigeria's cosmetic sector.

Conclusion

This study demonstrated that access to accurate cosmetic product information in the FCT, Nigeria, remains inadequate due to widespread labelling deficiencies, low consumer health literacy, ineffective regulatory enforcement, and culturally driven cosmetic use practices. The high prevalence of ACE (69.6%) underscores the public health urgency of addressing these gaps. While the statistical association between information access and ACE did not reach significance, the practical direction of the relationship and overwhelming stakeholder consensus affirm that improved labelling and truthful advertising are essential safeguards against cosmetic-related harm.

The study highlights that females, married individuals, employed persons, and higher earners are particularly vulnerable to ACE, suggesting the need for targeted public health campaigns. Regulatory authorities, particularly NAFDAC, should strengthen enforcement in informal markets, invest in laboratory capacity, and promote inter-agency collaboration. Consumer education initiatives especially those delivered through social media, community radio, and market outreaches should be prioritised to improve label literacy and empower safe cosmetic choices. Industry stakeholders should be incentivised to adopt full labelling transparency and evidence-based advertising practices.

Future research should employ longitudinal designs to establish causal pathways between cosmetic information access and ACE incidence. Product-specific and region-specific studies are also recommended to capture the diversity of informal cosmetic markets across Nigeria and inform sustained, context-sensitive policy interventions.

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