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Shisha smoking in Nigeria: Dissecting youth knowledge, awareness and perceptions (KAP) and health implications

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ABSTRACT

The study aimed to dissect the young Nigerian's, within the age of 18 – 35 years, Knowledge, Awareness, and Perceptions (KAP) of shisha smoking in Kaduna Metropolis. A semi-structured questionnaire was administered to 259 youths, of whom 258 were included in the analysis. Descriptive statistics, chi-square tests, and ordinal logistic regression were used to examine the relationship between socio-demographic factors and shisha-related KAP. The findings showed that 28.29% of the participants, who were males in their 18 years, have tried using shisha. The study revealed that there exists a significant relationship between the participants' age and level of education, and their level of awareness and perceptions of shisha's harmfulness. However, no notable relationship was found with specific knowledge of shisha's contents. Though a significant gap was identified in their knowledge about its harmful contents and health implications, a reasonable proportion of the youths regarded shisha as less dangerous than cigarettes. It was, however, opined that the popularity of shisha among Nigerian youth was due to the lack of accurate information and misconceptions. The study calls for an urgent need for public health interventions to educate youths on the health risks associated with shisha.

Keywords: *Shisha, Waterpipe, Knowledge, Awareness, Perception, Nigerian Youth, Smoking, Cigarettes*

INTRODUCTION

Shisha is a well-known method of smoking tobacco or other substances using a water pipe and known to many by different names, ranging from one locality to another, amongst these are: hookah, narghile, hubble-bubble, or goza (World Health Organization [WHO], 2015). The standard waterpipe (also known as hookah or shisha), as shown in Figure 1, consists of several key components: a *head* that holds tobacco; a *hot coal*, which is connected to the bowl that holds water via a hard tube known as the *body*; and the *bowl* contains a *mouthpiece* for a *hose* connection at the end. The filtered smoke travels to the mouthpiece via the hose after the smoke produced by the head descends to the water bowl (Patil et al., 2022).

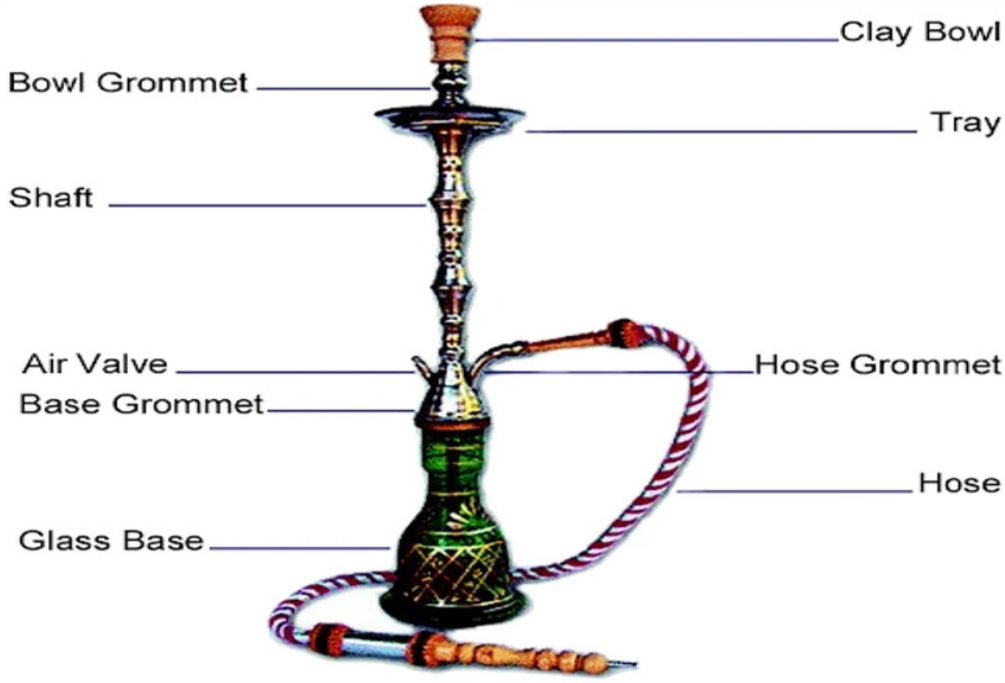

Fig. 1: A Waterpipe/Shisha (Source: Moghadam et al., 2023)

The origin of shisha smoking is still debated, but historical records often trace it back to Persia or India several centuries ago (Goodman, 1994). It steadily gets to other regions such as North Africa, the Middle East, and some parts of Asia, and shisha eventually integrates into their social and cultural lifestyles (Maziak, 2011). Globally, tobacco usage has taken a new shape in recent times, such that shisha is acquiring so much popularity beyond its original regions (WHO, 2015) and has been perceived as a safer alternative for cigarette smoking, owing to deceptive market strategies by promising that shisha has a low nicotine (0.5%) and 0% tar (Patil et al., 2022). Shisha continues to gain its popularity and is becoming a household to young people and teenagers, upon the decline of cigarette smoking in some

developed countries (Primack et al., 2008). This rise is partly due to the belief that shisha is less harmful than cigarettes because the smoke passes through water.

According to an Oxford Learner's Dictionary, Youth is defined as the time of life when a person is young, especially the time before a child becomes an adult. Merriam-Webster corroborates that by defining "youth" as the early period of existence, growth, or development, especially the period between childhood and maturity. There is no unique age bracket for youth; persons between the ages of 18 – 35 years are classified as youths according to the African Youth Charter, while the National Youth Policy classifies youth as persons within the age bracket of 15 – 29 years in Nigeria. However, many governmental institutions in Nigeria maintain 18 – 35 years as the youth age classification. The growing popularity of shisha smoking among Nigerian youth has become a pressing public health concern. A large number of young people continue to use shisha even with the rise in scientific evidence on its harmful effects and addictive potential (Eissenberg, 2013; Onyeonoro et al., 2015; Kanmodi et al., 2019; Nweke et al., 2024), mostly caused by the roles of peer pressure, media portrayals, and the belief that shisha is a safer substitute to cigarettes (Mdege et al., 2024).

The possible long-term health implications, the crystal-clear lack of knowledge, and the lack of awareness amongst the youth have raised great concern. Several researchers have worked on the health risks, prevalence, and general perception of shisha smoking, primarily among adolescents and young adults (Oshikoya & Alli, 2006). Amongst these studies, for example, Ekpenyong (2012), Singh et al. (2017), Kabbash and Saied (2020), and Adu et al. (2024), identified the rise in popularity of shisha use in the world and a series of influencing factors have all been explored, such as media influence, peer pressure, and misconceptions about shisha safety in comparison to cigarettes. Nevertheless, the majority of these studies have been carried out in non-African settings such as Asia, the Middle East, and Western countries, with a few studies targeting the Nigerian context. For instance, in the study of Erinoso et al. (2021) conducted in Lagos, comprising youths, it was revealed that some of the shisha users also smoke other kinds of tobacco. In the same vein, Fagbule et al. (2021) found that use of cigarettes and alcohol was pronounced among the secondary school students, while Odinka et al (2019) examined the association between drug abuse and psychological factors among university students in Enugu, Nigeria. It implies that while focusing on preventive measures for risky behaviours, shisha needs to be targeted.

Additionally, investigations on the prevalence of shisha smoking have been conducted by a few studies in Nigeria (Odukoya et al., 2014; Adu et al., 2022; Fagbule & Cadmus, 2022), yet they lack comprehensive empirical studies exploring the knowledge, awareness and perceptions (KAP) of shisha use among Nigerian youths. Udeaja (2017), Olasina (2019), and Batra et al. (2024) either focused on the perception or awareness of shisha, without

exploring their relationship or the socio-cultural factors influencing them. It was revealed in the work of Osibogun et al. (2020) that many young Lagosians had limited knowledge about the dangers of hookah smoking; Kanmodi et al. (2019) opined that users of shisha in Northwest Nigeria had a poor knowledge of its health implications. Though it was discovered in the work of Nweke et al. (2024) that several Nigerian medical students were aware of the harmful chemicals contained in both e-cigarettes and shisha. The existing literature has reported the rising prevalence of shisha usage in Nigeria; there exist huge gaps that require urgent attention on the youth's KAP of shisha smoking employing quantitative data. This becomes paramount important because most of the methodologies used in the previous studies (e.g. Egbe, 2013; Omoalako-Adesanya, 2016; Mdege et al., 2024; Okeke et al., 2025) have always been qualitative or descriptive in nature, debarring the generalization of the findings. This becomes imperative for researchers to investigate the extent of awareness and knowledge towards shisha among youths in Kaduna Metropolis because more youths adopt the habit of consuming shisha without necessarily having a full understanding of its associated risks, which this study aimed to address. More so, the study determines the factors significantly influencing the perception of the harmfulness of shisha compared with cigarettes. Acquiring young people's intuition about their knowledge and beliefs about shisha is relevant for designing effective health education campaigns, informing public health policies, and mitigating the long-term health risks associated with its increasing popularity.

MATERIALS AND METHODOLOGY

Study Area

Kaduna is one of the Northwest states in Nigeria, a vibrant state, known for its diversity and highly populated with young people (Ayuba, 2020). The rapid growth of recreational centres in Kaduna, such as shisha lounges, makes it an ideal setting to investigate youth-related tobacco behaviours.

Study Design

A cross-sectional survey was adopted to examine the youths' KAP of shisha smoking.

Study Population and Eligibility Criteria

The study population consists of youths between 18 and 35 years residing in Kaduna Metropolis at the time of this survey.

Sampling Technique

A non-probability convenience sampling technique was used to select participants. This technique involves the selection of participants who are willing to take part in the study, who are easily accessible to the researcher, which boosts the chance of collecting and collating

honest and accurate responses (Etikan et al., 2016). This research has a high sensitivity, since discussions circulate the substance use, mostly considered as private or stigmatized in certain communities, hence, why the technique was employed. Permission to gain access to the participants (youths) in the community settings, such as schools, transport hubs, markets, and recreational centers, was approved by the district heads and community leaders.

Instrument Development

A self-administered semi-structured questionnaire prepared in English was used for the collection of the data and was subsequently translated into Hausa to ensure inclusiveness and gain a wider coverage because Hausa is predominantly the local language spoken in Kaduna State. An expert who can speak both English and Hausa fluently assisted in the translation. The items of the developed questionnaire were excerpted from the Global Youth Tobacco Survey (GYTS) (WHO & Centers for Disease Control and Prevention [CDCP], 2019). It includes participants' socio-demographics, shisha knowledge, awareness of health risks, and perceptions of shisha's harmfulness.

Pilot Testing and Reliability

The developed questionnaire was piloted with twenty youth, primarily to improve clarity and cultural appropriateness. A few changes were made based on the comments received. The awareness and perception scores' Cronbach's alpha value was ($\alpha = 0.87$) satisfied acceptable reliability limits.

Ethical Considerations

Despite the study not having an official institutional ethics approval before the collection of data, it adheres strictly to accepted ethical guidelines for low-risk behavioural research, such as stating and explaining the study's objectives to participants, participants' involvement was voluntary, assurance of confidentiality, and participation was anonymous.

Data Collection Procedure

Paper questionnaires that were self-administered were given out at authorized community places and collected there. The researchers made sure that information was kept private and offered advice where needed.

Data Analysis

The collected data were sorted, given identification numbers, coded, and entered into Microsoft Excel. The data were screened and made tidy before statistical analysis was carried out. The data cleaned were analyzed using the R statistical software (R Core Team, 2025). The analysis involved: descriptive statistics (frequencies, percentages), visualization (bar charts and word clouds), chi-square tests for associations, and ordinal logistic regression

to determine the predictors of perceptions regarding the harmfulness of shisha relative to cigarettes.

RESULTS AND DISCUSSION

Out of a total of 259 questionnaires administered, 258 were completed and returned, which represents a response rate of 99.6%. Hence, the descriptive statistics of the demographic information of the participants are presented in Table 1. The first time the participants tried shisha was at an average age of 17.98 years, such that the least initiated age of shisha use was 9 years, while some of the participants started smoking shisha at the age of 24 years; while for those participants who are non-users of shisha were aware of shisha at an average age of 17.7 years. More than half of the participants, 149 (57.75%), were in the 20-24 age group; hence, the participants were predominantly under the age of 30, with the majority being male, while 86 (33.33%) were female. Almost three-quarters of the participants, 177 (68.60%), were undergraduate, and 45 (17.44%) were graduate; this implies that the participants in this study were highly dominated by educated youths which could have impacts on the participants' health knowledge, perceptions, and openness to awareness campaigns, with just 12 (4.65%) having a primary level of education. 73 (28.29%) of the participants stated that at some point in their lives, they had tried shisha, while 185 (71.71%) reported never having tried shisha. The proportion of those who had tried shisha might appear smaller, but not negligible due to the possible health and societal implications of smoking shisha. There is a potential gender-based trend in the taking of shisha because amongst those participants who had tried shisha, 84.67% were male. This supremacy, where males are likely engaged more in or indulged in risk-taking activities, is an indication of social or behavioural inclinations. Out of the 258 participants, 81.01% (209) of them lived in urban areas, and 49 (18.99%) resided in rural areas; it is crystal clear that the use of shisha and related social places like social gatherings or parties and lounges or cafes, are akin to urban settings. Of all the participants, 30 (11.63%) preferred private homes, 24 (9.30%) preferred social gatherings or parties, and 19 (7.36%) preferred shisha lounges or cafes as the best location to smoke shisha. These give an insight into the shisha usage among the youths in Nigeria, as it helps the interpretation of participants' awareness and perceptions. A sizeable proportion of the participants stated that they started smoking shisha before gaining entrance to university, with 21 (8.14%) of them indicating early exposure to smoking of shisha at primary or before entering secondary school; these further emphasize the influence of environmental or societal factors in the adoption of behaviours by children. Forty-two (16.28%) of the participants reported that they had discontinued usage of shisha, who are a subset of former shisha users who have ceased from its consumption for personal or health reasons. Only a small percentage, 15 (5.81%), of the participants were occasional usage of shisha at least once a month, and 12 (4.65%) used shisha once a week or more.

Table 1: Descriptive Statistics of the Demographic Information

Variables		Frequency (N = 258)	Percentage
Age	18 – 19	40	15.50
	20 – 24	149	57.75
	25 – 29	48	18.60
	30 – 35	21	8.14
Gender	Male	172	66.67
	Female	86	33.33
Level of Education	Primary	12	4.65
	Secondary	24	9.30
	Undergraduate	177	68.60
	Graduate	45	17.44
Location	Urban	209	81.01
	Rural	49	18.99
Tried Shisha	No	185	71.71
	Yes	73	28.29
Location started smoking Shisha	Never tried	185	71.71
	Pre-Secondary	21	8.14
	Pre-University	38	14.73
	At University	13	5.04
	After University	1	0.39
Frequency of Shisha usage	Never tried	185	71.71
	No longer use it	42	16.28
	Only a few times	4	1.55
	Once a month or so	15	5.81
	Once a week or more	12	4.65
Preferred location to smoke Shisha	Shisha lounges or cafes	19	7.36
	Private homes	30	11.63
	Social gatherings/parties	24	9.30
	Never encountered it	185	71.71

(*Source:* Authors' Survey)

The participants' awareness of the potential health risks associated with shisha smoking among Nigerian youth was depicted using the bar plot and the word cloud visualization, as shown in Figures 2 and 3, respectively. There is a notable portion of participants (133) who are not sure of the health implications of using shisha, suggesting that low awareness might be influenced by socio-demographic information; this revealed a wider knowledge gap among Nigerian youth on the spreading of dangers that await potential shisha smokers. Lung cancer, respiratory problems, and heart disease were the prominent pulmonary diseases identified by the participants as possible health implications of shisha smoking. Other perceived health risks were mental health issues and headaches. The finding aligned with existing literature on the poor knowledge of the harmful effects of shisha smoking, for instance, Kanmodi et al. (2019) surveyed the active shisha users in Kebbi State, and it was discovered that less than a median of the participants could correctly identify the high consequences of shisha smoking, such as cancer, cardiovascular disease, and infections

Fig. 2: Bar Chart Showing the Ddistribution of health risks associated with Shisha

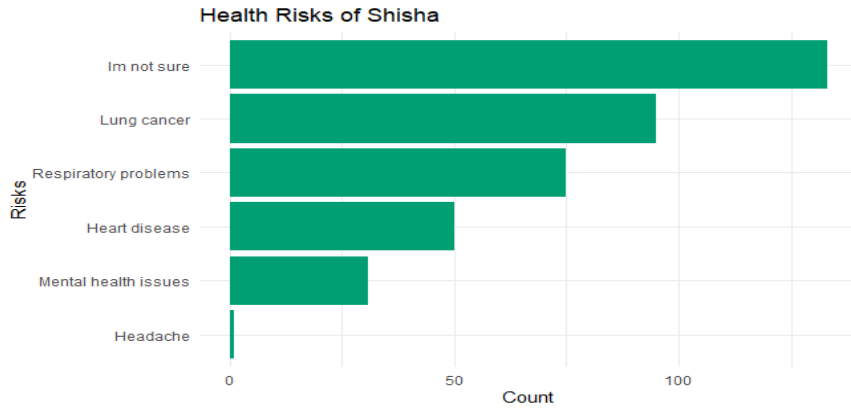

Fig. 3: Word Cloud Visualization of Reported Health Risks of Shisha Smoking

The result of the Chi-square test for examining the association between the participants' responses on having tried shisha and other related variables that measure participants' level of knowledge and awareness of shisha smoking is presented in Table 2. There is a significant association between the participants who have tried shisha and knowledge of shisha contents (= 40.6878, df = 1, $p < 0.05$). This implies that experience may slightly increase awareness, but it doesn't guarantee accurate knowledge. A low level of shisha's knowledge was revealed, with an alarming proportion of 92.2% of the participants not knowing what it contains; there exists a huge concern amongst the participants who have tried shisha, more than 75% of them didn't know what shisha contains. This reflects a minimal perceived severity, as a lack of knowledge may lead to a neutral or even positive attitude towards the behaviour, most especially when individuals do not understand the harmful contents of shisha, they may underrate the health risks ahead. In spite of this noticeable gap, almost all the participants (97.7%) reported that they have heard of shisha, which implies that there is a high level of awareness about shisha. There is consistency across both participants who have tried shisha (93.2%) and non-users (99.5%). The chi-square result = 20.5423, df = 1, $p < 0.05$) shows a significant association between shisha use and awareness of health risks. Furthermore, 88.4% of the participants were aware of shisha's health risks, but awareness was significantly higher among participants who hadn't tried shisha (94.1%) in comparison with those who had tried shisha (74.0%). This wider margin may translate to individuals having lower perceived susceptibility to health risks or may downplay the severity, and could encourage continued usage of shisha despite being aware of its health risks.

Table 2: Level of Knowledge and Awareness of Shisha

Characteristics		Tried Shisha		Total	(P-value)
	No (N = 185)	Yes (N = 73)		(N = 258)	
Knows Shisha contents	No	183 (98.9)	55 (75.3)	238 (92.2)	40.6878 (< 0.05)
	Yes	2 (1.1)	18 (24.7)	20 (7.8)	
Heard of Shisha	No	1 (0.5)	5 (6.8)	6 (0.2)	9.1718 (0.0025)
	Yes	184 (99.5)	68 (93.2)	252 (97.7)	
Aware of health risks	No	11 (5.9)	19 (26.0)	30 (11.6)	20.5423 (< 0.05)
	Yes	174 (94.1)	54 (74.0)	228 (88.4)	
Want an awareness campaign	No	3 (1.6)	11 (15.1)	14 (5.4)	18.4433 (< 0.05)
	Yes	182 (98.4)	62 (84.9)	244 (94.6)	

Characteristics		Tried Shisha		Total	(P-value)
No (N = 185)		Yes (N = 73)		(N = 258)	
Thinks shisha harmful	No	4 (2.2)	20 (27.4)	24 (9.3)	39.5091 (< 0.05)
	Yes	181 (97.8)	53 (72.6)	234 (90.7)	
Perceptions of Shisha and Cigarettes	Equally harmful	61 (33.0)	12 (16.4)	73 (28.3)	53.3112 (< 0.05)
	Less harmful	30 (16.2)	45 (61.6)	75 (29.1)	
	More harmful	56 (30.3)	12 (16.4)	68 (26.4)	
	Not sure	38 (20.5)	4 (5.5)	42 (16.3)	

(*Source:* Authors' Survey)

A total of 244 (94.6%) participants expressed interest in shisha awareness campaigns, out of which 98.4% of them were non-users and 84.9% were participants who have tried shisha. Out of 234 (90.7%) of the participants who believed shisha smoking is harmful, there exists a stronger belief, though, as expected, amongst those who haven't tried shisha that it is harmful. However, the participants had divergent perceptions on the comparison of the health risks of shisha and cigarettes; 73 (28.3%) of the participants believed that they are both equally harmful, 75 (29.1%) perceived shisha as less harmful than cigarettes, and 68 (26.4%) viewed shisha as being more harmful than cigarettes. Among those who have tried shisha, 61.6% considered shisha to be less harmful than cigarettes. This misconception might prevent individuals who consume shisha from changing their behaviour, particularly if they perceive smoking shisha as a safer alternative to cigarettes. Furthermore, it shows skewed risk assessment, which enhances dangerous behaviour and minimizes perceived severity. This finding shows that teenagers are vulnerable and there is a need for early, targeted interventions aimed at correcting misconceptions and stopping their inception.

Table 3: Ordinal Logistic Regression Predicting Perception of the Harmfulness of Shisha Vs Cigarettes

Predictor		Estimates	AOR (95% CI)	P-value
Gender	Female (*ref.*)			
	Male	0.1504	1.16 (0.69 – 1.95)	0.567
Age Group	18 – 19 (*ref.*)			
	20 – 24	0.0848	1.09 (0.55 – 2.16)	0.809
	25 – 29	–0.4339	0.65 (0.27 – 1.53)	0.321
	30 – 35	–1.4748	0.23 (0.07 – 0.75)	0.014
Level of Education	Primary (*ref.*)			
	Secondary	–0.5013	0.61 (0.17 – 2.20)	0.445
	Undergraduate	–1.7152	0.18 (0.06 – 0.58)	0.004
	Graduate	–1.2309	0.29 (0.08 – 1.04)	0.058
Location	Rural (*ref.*)			
	Urban	–0.4861	0.62 (0.33 – 1.15)	0.130
Location Started	Never Tried (*ref.*)			
	Pre-secondary	–0.7832	0.46 (0.05 – 4.35)	0.496
	Pre-university	–0.4377	0.65 (0.06 – 6.61)	0.712
	At university	–0.0054	0.99(0.09 – 11.31)	0.997
	After university		0.00 (0.00 – 0.00)	< 0.001
Preferred Smoking Location	I have never encountered it (*ref.*)			
	Private homes	0.9721	2.64 (0.26 – 26.77)	0.411
	Shisha lounges/cafes	–0.5481	0.58 (0.06 – 5.38)	0.630
	Social gatherings/ parties	1.0390	2.83 (0.27 – 29.72)	0.387
Perception of Shisha Harm Compared to Cigarettes	More harmful (*ref.*)			
	More harmful | Equally harmful	–2.9689	0.05 (0.01 – 0.20)	<0.001
	Equally harmful | Less harmful	–1.5966	0.20 (0.05 – 0.77)	0.019
	Less harmful | Not sure	–0.0090	0.99 (0.27 – 3.70)	0.989

CI = Credible Interval, AOR = Adjusted Odds Ratio

(*Source:* Authors' Survey)

Table 3 shows the results of an ordinal logistic regression that determines significant factors in predicting the perception of the harmfulness of shisha compared to cigarettes, measured as more harmful, equally harmful, less harmful, and not sure. The model satisfied the proportionate odds assumption, as validated by the Brant test ($\chi^2 = 39.00$, df = 30, p = 0.13) and the Lipsitz goodness-of-fit test ($\chi^2 = 15.065$, df = 9, p = 0.0892), showing that the ordinal logistic regression model is adequate for this study. Age, educational level, and harm perception were factors found to have a significant association with how participants perceived the dangers of shisha relative to cigarettes. Participants between the ages of 30 and 35 were 77% less likely than those between the ages of 18 and 19 to believe that shisha is less dangerous than cigarettes (Estimate = –1.4748, AOR = 0.23, 95% CI: 0.07–0.75, p = 0.014). It is clear that older people typically perceive themselves to be more vulnerable and have a stronger awareness of health risks. Education may affect perceived behavioural control and shape normative beliefs around substance use. Individual with an undergraduate degree (Estimate = –1.7152, AOR = 0.18, 95% CI: 0.06–0.58, p = 0.004) were 82% less likely, and those with graduate degree (Estimate = –1.2309, AOR = 0.29, 95% CI: 0.08–1.04, p = 0.058) were 71% less likely than those with only a primary education to believe that shisha is less harmful than cigarettes.

It was further revealed that 95% fewer participants thought shisha was less dangerous than cigarettes than those who thought it was more harmful (Estimate = –2.9689, AOR = 0.05, 95% CI: 0.01–0.20, p < 0.001). Compared to those who thought shisha was less hazardous, those who felt it was equally harmful were 80% less likely to underestimate its harm (Estimate = –1.5966, AOR = 0.20, 95% CI: 0.05–0.77, p = 0.019). Participants who initiated the use of shisha after university had an AOR of 0.00 (p < 0.001). Even while this might sound drastic, it implies a near-total split, indicating that no one in that group thought shisha was less dangerous. However, because of a possible small sample size in this group, there is a need to exercise some level of caution while interpreting it (Agresti, 2010). The findings in this study further uphold the applicability of health behaviour models in substantiating health perceptions. Increasing the level of awareness could be pertinent to changing public perception and minimizing the social acceptability of shisha use, specifically among younger and less educated populations.

CONCLUSION

The findings in this study have revealed that youths smoking shisha in Nigeria is not just a rising concern to public health but also one that is majorly caused by incorrect information and misconceptions. The study further reported that shisha usage among young men in urban areas is alarming, and the age at initiation raised concern since many young people in Nigeria believe that shisha is less harmful than cigarettes. The general perception that shisha is a safer, less harmful substitute for cigarettes is a major factor in its popularity, especially

among younger and less educated people. However, older youths and those with higher education levels were found to be significantly less likely to perceive shisha as a safer substitute for cigarettes. The study emphasizes that although young people are generally aware of the serious health concerns associated with shisha usage, many are unaware of them. For many young people, shisha is an alluring and seemingly harmless alternative because of its social character and these misconceptions. This study supports the notion that formal education and maturity are important ingredients of health literacy by confirming that age and education are essential in forming more precise assessments of the dangers associated with shisha. Despite the high rate of exposure, there is little knowledge on the harmful elements of shisha, which suggests a risky disconnect that might have long-term health implications on a vulnerable group. Consequently, addressing this issue calls for a multidimensional strategy that goes beyond simple awareness to include a more focused and all-encompassing teaching approach. Disclosure of personal behaviours related to shisha use due to stigmatization by the participants might have affected the accuracy of self-reported data, cultural sensitivity, and the youth-centric nature of the study. Gaining access to a sufficiently large sample was challenging, are some of the shortcomings identified in this study. Future research could be replicated across different geopolitical zones in Nigeria to gain a national perspective.

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Conflict of Interests

The authors declared they have no competing interests.

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