

Leveraging health information to combat misinformation and addiction to consumption of herbal bitters in Ado-Ekiti, Ekiti State, Nigeria

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Abstract

Due to the perceived nature of their production and efficacy claims, the growing consumption of herbal bitters by young people in Nigeria has been linked to serious health issues, such as addiction and organ damage. Using the survey design, this study revealed through the responses of 386 respondents in Ado-Ekiti that social norms as well as peer influence and misinformation were among the consumption determinants of herbal bitters in Ado-Ekiti, Ekiti State, Nigeria. Many youths are aware of some health issues associated with consistent consumption of herbal bitters, such as organ damage; however, there are still information gaps concerning specific risks posed to the liver and kidneys. For those who are aware of these risks, peer pressure and misguided beliefs about therapeutic values strongly influence their continued consumption of herbal bitters. This study recommends that public health interventions aimed at improving health outcomes for consumers of herbal bitters should focus on dispelling myths about risks, raising hazard awareness, and implementing fact-based educational interventions to initiate optimal health behaviour changes and promote healthier lifestyle choices.

Keywords: Addiction, Health information, Health risks, Herbal bitters, Misinformation

Introduction

Herbal bitters are mixtures derived from fruits, roots, and plants that are frequently ingested for their therapeutic qualities. Around the globe, herbal bitters are known to aid digestion and relieve gastrointestinal discomfort (WHO, 2018). Herbal bitters, which comprise local plants and alcohol, are used to treat illnesses like malaria and stomach ailments. Despite their benefits, there are safety concerns due to a lack of regulation of standard as well as the possible toxicity associated with unregulated use (Odugbemi, 2008; WHO, 2019). In Nigeria, herbal bitters are claimed to offer a range of health benefits leading to their widespread consumption. Thus, many people drink them to "cleanse" their bodies (Nigerian Tribune, 2020). Some of the most common herbal bitters in the country include *Odogwu Bitters*, *Action Bitters*, *D-Rider Bitters*, *Gbefun Super Bitters* and *Mowapa Bitters*. These herbal bitters, usually sold in plastic containers or sachets of 30-50ml, pose serious health risks due to their high alcohol concentration, which ranges from 37% to 45% (The Punch, 2019). Another issue is related to confusion in the classification of herbal bitters in that, the consumers often mistake distilled gins known as *Kai-Kai* (in Hausa) or "Sapele Water" (in Niger

Delta) for herbal bitters. Whichever way, the excessive consumption of herbal bitters can be detrimental (Mayo Clinic, 2022).

The worldwide popularity of herbal bitters—plant-based mixtures often blended with alcohol—is based on their purported health benefits, such as detoxification, improved digestion, and immune boosting. Herbal bitters are widely marketed as natural remedies, which tend to attract many individuals seeking health-enhancing options in lieu of synthetic medications (World Health Organisation, 2019). The consumption of herbal bitters is rampant in Nigeria, as people widely believe that it enables them to "cleanse" their systems (Nigerian Tribune, 2020). Nonetheless, there are concerns about misconceptions of detoxification with bitters in developing countries like Nigeria with inadequate health literacy and regulatory frameworks (Awodele et al., 2011).

The lack of manufacturing and distribution standards for herbal bitters poses questions about their safety and effectiveness (Mayo Clinic, 2022). The cultural significance of some herbal bitters does not mitigate the health risks associated with non-standardised concoctions—one of which is hepatotoxicity (Odugbemi, 2008). Despite

the risks associated with their consumptions, there has been a prevailing tendency in Nigeria to embrace herbal bitters as good therapeutic choices (The Punch, 2019). Ekor (2014) noted that hepatotoxicity and potential interactions with prescription drugs were among the primary health hazards linked to herbal bitters consumption.

Exaggerated benefits and misuse due to confusions with classification have been identified as the major issues consumers of herbal bitters misunderstand. Nevertheless, not many efforts are being made towards raising awareness or enforcing compliance with regulations in the use of herbal bitters as noted by Okonkwo and Okoye (2020). This disparity within legislation alongside the provision of education and health information is detrimental to people's health among vulnerable populations. The apparent health misinformation affecting the consumption patterns of herbal bitters in Nigeria requires not only systematic but also empirical examination. There is still insufficient data on the social and behavioural aspects of herbal bitters use, especially concerning addiction and misinformation about their health benefits. Focusing specifically on Ado-Ekiti, Ekiti State—where socioeconomic and cultural factors shape attitudes

toward herbal bitters—this research aims to fill the identified gaps by using health data to explore the problems of addiction and misinformation associated with their use.

Statement of the problem

Due to their supposed health benefits and cultural significance, herbal bitters are commonly consumed in Nigeria. However, the uncontrolled production and improper labeling of these products pose significant toxicity risks alongside possible harmful drug interactions (Ekor, 2014). The lack of consistent regulatory oversight, coupled with widespread misinformation in relation to the use of the products among young people in Ado-Ekiti, Ekiti State, Nigeria is particularly concerning. Although it is argued in extant studies that the consumption of herbal bitters yields some health benefits, the dearth of thorough research on the standardization and regulation of their production and distribution, leaves a serious gap in the management of health risks associated with the consumption (Odugbemi, 2008; WHO, 2019).

On the other hand, the problem of product standardisation and regulation is further compounded by the circulation of false narratives about the products, which can lead to their abuse and

overconsumption (Okonkwo & Okoye, 2020). Many Nigerians rely on unsupported claims about the detoxifying effects and immune enhancement benefits of herbal bitters to justify their abuse of the products, which leads to addiction (Okonkwo & Okoye, 2020; Nigerian Tribune, 2020).

Besides the deliberate targeting of young people by the marketers of herbal bitters in Nigeria, the young people are usually the most vulnerable to misinformation (Nigerian Tribune, 2020). Further, their targeting in the production and marketing of herbal bitters increases the risks they face with the consumption of the products, such as addiction to excessive drinking of alcoholic beverages mixed with herbal bitters

The most recognised brands of herbal bitters often have an alcohol content of 45%. The highest level of consumption of these products is among the youths for many reasons, notably lack of health awareness and misinformation. Moreover, poor regulation of the herbal bitters industry in Nigeria worsens the situation as unscrupulous manufacturers are allowed to produce and sell substandard products (Awodele et al., 2011). This situation can lead to serious consequences, including addiction, severe health complications, and even death.

Focusing on the youths in Ado-Ekiti, Ekiti State, Nigeria helps address these research gaps. The primary goal of this study is to provide accurate information that counters misinformation on herbal bitters and reduces addiction through the exploration of targeted evidence-based health campaigns aimed at promoting safer consumption practices.

Research objectives

The current study is guided by the following objectives:

- a. to investigate the prevalent trends in the consumption of herbal bitters by youths in Ado-Ekiti.
- b. to explore the factors influencing the consumption of herbal bitters by youths in Ado-Ekiti.
- c. to evaluate young people's level of awareness and understanding of the health dangers related to the intake of herbal bitters in Ado-Ekiti.
- d. to assess the impacts of adequate health information and misinformation on youth addiction to herbal bitters in Ado-Ekiti.

Research questions

The following research questions strengthened the study:

- a. What are the prevalent trends in youth consumption of herbal bitters in Ado-Ekiti?
- b. What factors influence youth consumption of herbal bitters in Ado-Ekiti?
- c. To what extent do youths in Ado-Ekiti know of the health concerns associated with the intake of herbal bitters?
- d. What are the impacts of adequate health information and misinformation on youth addiction to herbal bitters in Ado-Ekiti?

Review of related literature

Consumption of herbal bitters: sociocultural foundations

Herbal bitters have been an integral part of medicine and culture for centuries, admired for their alleged health benefits and values in strengthening social bonds. In Nigeria, herbal bitters are widely used and acclaimed to assist with digestion while also curing ailments such as fever and malaria. Furthermore, they serve as relaxation beverages that foster community bonding, illustrating that the sociocultural role of herbal bitters extends beyond personal well-being. These dual functions underscore the

importance of herbal bitters in traditional practices (Okigbo & Igwe, 2007).

The use of herbal bitters stretches back to Chinese medicine, *Ayurveda*, and *Unani* medicine, which emerged from Islamic civilisation, indicating their broad appeal as a therapeutic agent (Khan & Abourashed, 2011). The World Health Organisation estimates that around 80% of the global population relies on traditional medicine systems, including the use of herbal bitters as a form of primary healthcare (World Health Organization, 2019). The diffusion of bitters worldwide was encouraged by European colonial expansion, which incorporated local practices into colonial medical systems. For instance, Nigerian herbal bitters today often include local ingredients like bitter kola, along with ginger and garlic, reflecting a blend of customs and history (Okigbo et al., 2007).

Trends and consumption patterns of herbal bitters among the youth in Ado-Ekiti, Nigeria

Herbal bitters and their consumption have become increasingly popular among the youth of Ado-Ekiti, Nigeria, primarily due to cultural beliefs, health claims, and recreational purposes. Health-related motives such as weight reduction, detoxification, or even increased libido are common held among the youthful

population for the consumption of herbal bitters (Showande & Amokeodo, 2014; Oyebode & Olugbodi, 2018). These misconceptions, coupled with the belief that herbal bitters are always safe lead to reckless consumption, which poses a considerable risk of liver damage or even addiction. Furthermore, bitters are often mixed with other drugs or high alcohol-content substances, which amplify health risks (Ibraheem & Adigun, 2021).

Showande and Amokeodo (2014) noted that cultural and socioeconomic factors influence the consumption prevalence of herbal bitters among the youth and young adults of Ado-Ekiti. For example, herbal bitters are served at parties and social gatherings, and often used to show social status and maturity among young men (Afolabi & Erinle, 2015). Furthermore, Oyebode et al (2018) noted that these beverages are freely available with street vendors or within the markets, which help to increase consumption rate among the youth in Ado-Ekiti. Nevertheless, many herbal bitters drinks contain high alcohol content, raising concerns about dependency and risky behaviours such as unprotected sex, associating with reckless individuals, or experiencing alcohol-induced euphoria (Oyebode et al, 2018). This situation makes it vital to promote health literacy and awareness campaigns

about utilising herbal bitters responsibly. Ibraheem et al. (2021) argued that more focus is needed not only on public health intervention strategies but also on providing educational frameworks aimed at protecting the culture of consuming herbal bitters while dispelling the myths surrounding their use.

Health risks and dangers of herbal bitters consumption

Herbal bitters are marketed for their immune enhancing and detoxification functions, alongside weight management and digestive ailments' treatment. Kamdem et al. (2013) claim that bitters enhance the absorption of nutrition by stimulating bile and enzyme secretion. Some bitters, such as those derived from dandelion or gentian roots, possess anti-inflammatory and antioxidant properties which may have therapeutic potential in metabolic and gastrointestinal disorders (Gonçalves et al., 2020; Clarke et al., 2021). Regardless of these claims, there is a lack of consistent evidence supporting the effectiveness of herbal bitters, highlighting the need for rigorous research given the serious health risks associated with inconsistent manufacturing practices and poor regulatory oversight (WHO, 2019).

Lack of consistency in production standards is the most critical concern

with herbal bitters. Failure to meet minimum quality criteria interferes with uniform concentration of active ingredients across different product batches (Sehgal et al., 2019). Insufficient product transparency—particularly when hazardous ingredients like alcohol or heavy metals go unchecked—enables misleading health claims and makes preservative-laden products potentially dangerous (Lempert & Heinrich, 2022). Herbal bitters are also sold under the guise of dietary supplements, which allows them to escape stricter pharmaceutical regulations, exposing buyers to contaminated or misbranded substances (Smith et al., 2021).

These dangers are heightened by misinformation and exaggerated assertions. Pregnant women and the youth are two groups that can be exploited by excessive advertising because the information provided is tailored to their vulnerability (Ernst, 2012). Social media disinformation can undermine evidence-based medicine, making it more difficult to access treatments. What is even scarier is how herbal bitters can interact with prescribed medications such as blood thinners or insulin medications (Tachjian et al., 2010; Gardiner et al., 2020). One such herbal component, aristolochic acid,

has been linked to renal damage and some malignancies (WHO, 2019). These risks further reinforce the necessity of seeking medical advice prior to taking herbal bitters.

Factors influencing young people's consumption of herbal bitters

Psychological, sociocultural, and economic factors are susceptible to influence young people's consumption of herbal bitters. As noted by Kamdem et al. (2013), herbal bitters have been traditionally valued for their detoxifying and digestive health uses within families and are often used as folk medicine. Herbal bitters tend to be more widely used among young people when they are popular within their social circles, as peer pressure and family traditions significantly shapes perceptions and behaviours about the use of herbal bitters (Hughes et al., 2017). There is also an economic factor to this issue as herbal bitters are marketed as a natural and inexpensive alternative to conventional medication, which resonates with those seeking cost-effective healthcare (Kalia, 2005). The marketing often confronts topical health concerns among younger people who, (particularly among the younger demographic), seek natural and plant-based products more (Gonçalves et al., 2020).

The popularity of herbal bitters is fueled by marketing as well as social perceptions about stress management and alleged health benefits. Many young individuals tend to self-medicate with these products to alleviate stress, believing that the products enhance overall wellbeing (Ong et al., 2014). There are relentless promotional campaigns targeting the youth, including sociotropic media advertisement which enhance availability and desirability of herbal bitters (Smith et al., 2021). These campaigns underscore the need to understand why people use herbal bitters, so as to develop public health strategies aimed at promoting informed use while mitigating the risks arising from misuse or misinformation.

Awareness and understanding of health risks among young people who consume herbal bitters

Social and cultural influences tend to shape how a young person understands the specific health risks associated with using herbal bitters. Many young people often overlook some potential health concerns of the products such as liver damage, gastrointestinal complications, or interactions with other medications because of the misconception that herbal bitters are 'natural' (Oparah & Eferakeya, 2020). It is evident from available studies that there is very little awareness of the

health risks associated with using herbal bitters due to reliance on peer recommendations instead of empirical evidence. Lack of adequate health education was illustrated in a study where only 34% of respondents were aware of the negative consequences associated with using herbal bitters (Alade & Ayodele, 2019). Most consumers underestimate the strength and side effects of herbal bitters due to ignorance leading to engaging in hazardous activities (Kwatiah et al., 2020).

Similar sources of information influence both the consumption drive and habitual use of herbal bitters by young people in Nigeria. Due to social media frenzy, advertising, and even word-of-mouth, which magnify the perks of better digestion, detoxification, and increased sexual drive associated with herbal bitters consumption, the usual risks are often disregarded (Uchendu et al., 2021). Apart from misinformation, myths, alongside misconceptions further preclude consumers 'understanding of the risks of herbal bitters consumption. The consumers tend to view herbal bitters as "natural" concoctions or cure-alls for numerous ailments (Ogbuagu et al., 2020). Such perception gives a false sense of security regarding the safety of herbal bitters consumption, hence

contributing to their abuse and overuse. Research-based awareness initiatives with targeted myth-busting and fact-filled information on the pros and cons of herbal bitters consumption need to be developed to address these issues. This type of intervention is essential to help the youths with reliable information critical for informed health choices.

The role of health information in combating misinformation and addiction on the consumption of herbal bitters

Health education and awareness initiatives are vital for the prevention of youth addiction to herbal bitters and the debunking of misinformation. Moreover, awareness campaigns aimed at enhancing decision-making empower individuals, and prevent addiction and misinformation about the usage of herbal bitters. Available research suggests that properly designed health education programmes significantly improve behaviours, attitudes, and comprehension regarding the utilization of herbal bitters (Adeyeye et al., 2018). Available sources, such as physicians or reputable websites, play an equally important role in disseminating accurate information and curtailing the misuse of herbal bitters (Kwatiah et al., 2020). Public health programmes that use social media and hands-on workshops can help reduce

risky practices involving herbal bitters by engaging young people through their preferred channels (Uchendu et al., 2021). Such programmes also counteract false advertising by promoting evidence-based information, that empower individuals to question exaggerated claims.

Reputable sources, including medical practitioners and credible websites, play a vital role in curbing the spread of misinformation. Medical professionals provide reliable advice by refuting myths such as herbal bitters being 'chemical-free' and entirely safe. Healthcare providers, public health experts, and even influencers on social media should actively correct misinformation concerning herbal bitters to promote accurate information (Ogbuagu et al., 2020). Combating misinformation and addiction to herbal bitters requires critical thinking and media literacy strategies targeted at young people. Young people can be taught to seek credible information by promoting media literacy complemented by sound health education enshrined in school curricula (Uchendu et al., 2021). These approaches can enhance informed decision-making among the youth by helping them to question unreliable information, which will reduce addiction and vulnerability to false information about herbal bitters.

Health literacy, health information interventions and addiction prevention

Understanding the risks and advantages of herbal bitters by young people is crucial for preventing abuse and addiction, and health literacy plays a key role in this regard. The younger population's health literacy regarding herbal bitters and their potential benefits and risks is a serious issue. Many young people lack sufficient health literacy regarding herbal bitters and often consider them as harmless health remedies (Adeyeye et al., 2018; Alade & Ayodele, 2019). This gap is worsened by the lack of formal awareness on herbal bitters, compounded by reliance on unverified peer discussions and social media content. Misinformation related to such subjects as herbal bitters consumption comes due to cultural influences, widespread social media false narratives, and lack of credible sources (Kwatiah et al., 2020). Young people with higher levels of health literacy appear to recognize potential risks such as herb-drug interactions, liver damage, and in some formulations, the risk of addiction due to the way herbal bitters are produced (Oyebadejo et al., 2020). Closing this literacy gap is essential to help young people make informed decisions when faced with unproven health claims.

Aggressive health product advertising, cultural influences and a lack of reputable health information sources all contribute to ignorance and misinformation on herbal bitters. Preventive measures need to be taken to curtail addiction to herbal bitters by young people. Some well-designed public campaigns and educational programmes can significantly boost the understanding of the risks associated with herbal bitters consumption. Social media platforms are very influential and often propagate misinformation about the benefits of herbal bitters, such as enhanced libido and detoxification (Uchendu et al., 2021). Family-centered programmes, peer education, or counseling are other possible options for discouraging addiction to herbal bitters by young people that could prove beneficial (Ogbuagu et al., 2020). Furthermore, there is a need to form partnerships with other public health experts in planning targeted, evidence-based preventive interventions focused on tackling adolescent addiction issues concerning herbal bitters. Community initiatives involving parents, teachers, and health professionals can be used to formulate relevant, inclusive strategies to address health risks posed by herbal bitters. Such approaches complement efforts aimed at preventing addiction.

Theoretical framework

The Theory of Planned Behavior (TPB) and Health Belief Model (HBM) served as the theoretical foundations of this study. These theories are adequate for the study because they look at how attitudes, subjective standards, and perceived behavioural control can affect behaviours.

Icek Ajzen developed the Theory of Planned Behavior (TPB) in 1985 to explain how attitudes, subjective norms, and perceived behavioural control influence intentions and actions (Ajzen, 1991). Although it is often applied for developing interventions, such as those targeting addiction, it relies on reasoning that isn't always accurate. Herbal bitters exemplify the importance of considered perception because their use hinges on control, favorable societal feedback, and endorsement. For instance, young people with a positive evaluation of herbal bitters are more likely to intend using them when they perceive social pressure and believe they can control their consumption (Kwatiah et al., 2020). An example of a TPB-based intervention aimed at countering addiction and misinformation can be found in studies using attitude alteration through evidence-based advertising to highlight the risks of liver damage. Such

intervention is based on promoting consumer knowledge against peer pressure while lowering social expectations to consume herbal bitters. Hence, TPB-guided approaches can curb substance allure while informing choice (Oyebadejo et al., 2020).

The Health Belief Model (HBM), created in the 1950s by Rosenstock, uses six components to explain health behaviours: perceived susceptibility, severity, benefits, barriers, cues to action, and self-efficacy. It stresses the importance of personal views in motivating preventative health actions. Although HBM works well for tailoring interventions to individual perceptions, its focus on cognition can be a limitation due to emotional factors being overlooked. As noted by Rosenstock et al. (1988), "HBM remains a widely used approach for understanding and facilitating behavior change." Research indicates that young people are less likely to consume herbal bitters if they think that the associated health risks are severe and there are minimal benefits from consuming those herbal bitters or believe that they are susceptible to the alleged risks (Kwatiah et al., 2020). Therefore, influencing young people's beliefs through information—such as increasing awareness about the consumption of herbal bitters while stressing the

magnitude of misconceptions about their advantages—could help reduce their consumption of the product.

Methodology

The study employed a survey research design. The population studied consists of 521,323 residents of Ado-Ekiti metropolis in Ekiti State, Nigeria, as of 2020. The Taro Yamane sample size determination technique (Taro Yamane, 1967) was used to determine a sample size of 400 respondents. The respondents were chosen using a multi-stage sampling technique from six different areas of Ado-Ekiti: Adebayo Area, Bus Terminal Area, Bashiru Area, Oke-Ila Area, Housing/Adebayo Area, and Bank Road

Area. Data was gathered using a structured questionnaire that was pilot tested for reliability (Cronbach's alpha = 0.85) and verified by experts in the study area. A 5-step Likert scale was used to present the data and in order to draw sufficient conclusions, the Mean and Standard Deviation were determined (Pallant, 2013).

Data Presentation and Discussion

The responses from primary sources using a 5-step Likert scale questionnaire form the basis of the data presentations. Out of 400 copies of the questionnaire distributed, 386 copies were retrieved. Data presentation was done using the valid 386 copies of the questionnaire.

Table 1: *Demographics of Respondents*

Sex of Respondents		
Variable	Frequency	Percentage (%)
Male	251	65%
Female	135	35%
Total	386	100%
Age Distribution of Respondents		
18 – 22 years	197	51%
23 – 27 years	73	19%
28 – 32 years	62	16%
33 – 40 years	54	14%
Total	386	100%
Occupation of Respondents		
Students	54	14%
Civil Servants	31	8%
Artisans	166	43%

Commercial Drivers and Road Workers	135	35%
Total	386	100%

Note. Author's Field Survey, 2024

The demographic analysis of herbal bitters use on Table 1 shows that young adult males (65%) are more likely to consume herbal bitters, especially those between the ages of 18 and 22 (51%), and those who work as commercial drivers (35%), artisans (43%), or both. The reasons for using herbal bitters could be due to occupational stressors, cultural norms, or misguided perceptions concerning their health benefits. Consumption is lower among students, civil servants, women, and older adults. This suggests that men working in physically demanding and strenuous jobs

are the ones who fall victim to misinformation about herbal bitters. Unmitigated misconceptions about healthier behavioural choices and work-related addictions need to be addressed through targeted interventions, public health campaigns tailored towards the numerous high-risk populations and employing appropriate evidence-based culture-sensitive frameworks. Focused strategies targeting young people and specific occupational demographics can reduce the dependence on herbal bitters and improve informed choice-making.

Table 2: *Prevalent Trends of Youth Intake of Herbal Bitters in Ado-Ekiti, Ekiti State, Nigeria.*

S/N	VARIABLES	SA	A	U	S D	D	Mean	Standard Deviation	Remarks
1.	Youth in Ado-Ekiti frequently use herbal bitters	204	89	39	19	35	1.94	1.28	Limited prevalence is indicated by the fact that the majority of respondents disagree with frequent use.

2.	Youth in Ado-Ekiti are increasingly becoming addicted to herbal bitters.	58	158	118	2	50	2.55	1.16	Responses range from indifferent to rather agreeable, indicating moderate concerns about addiction.
3.	Majority of my friends frequently drink herbal bitters.	39	62	81	62	142	3.53	1.38	The majority's disagreement indicates that drinking frequently among peers is uncommon.
4.	Peer influence is what motivates youths in Ado-Ekiti to use herbal bitters.	104	216	27	9	30	2.08	1.06	It demonstrates that most people concur that the usage of herbal bitters is greatly influenced by peer pressure.
5.	Advertising and media campaigns are the reasons why youth in Ado-Ekiti frequently consume herbal bitters.	50	108	73	5	150	3.25	1.52	It indicates that the majority are either neutral or disagree, indicating that media and advertising have little influence.
6.	Youth in Ado-Ekiti are aware of the possible health hazards linked	239	66	46	5	30	1.76	1.20	Strong agreement demonstrates that young people are highly aware of the risks to their health.

	to consuming too many herbal bitters.								
7.	Due to false information on its efficacy, the use of herbal bitters by youth in Ado-Ekiti has increased.	104	201	30	9	42	2.19	1.18	Consensus indicates that a significant contributing factor to increased use is misinformation.

Note. Author's Field Survey, 2024

The application of the Health Belief Model (HBM) and The Theory of Planned Behaviour (TPB) in Table 2 shows, young people's herbal bitters consumption trend and captures the pattern of using herbal bitters by the youth in Ado-Ekiti. Moderate concern over addiction risk is driven by peer pressure (mean = 2.08) and misinformation (mean = 2.19), while infrequent usage modestly exceeds low levels (mean = 1.94). Knowing the health risks (mean = 1.76) indicates some success in campaigns aimed at changing behavior but suggests weak media impact (mean = 3.25). The data in Table 2 are supportive of interventions addressing social norms and peer attitudes as framed by TPB, focusing on attitudes, external

pressures, and perceived control, emphasizes action-encouraging outcomes that capture change. Dealing with beliefs about the risks of using herbal bitters enhances understanding of the associated health threats, underscores methods HBM encourages to counteract such myths, supports the Theory of Planned Behaviour, aids decisions on removing social norms constraining action loops closed around important factors for change, and facilitates expected results sought after. The two hypotheses remain valid based on these outcomes regarding the frameworks underlying young adult herbal bitters use in a behavioural context.

Table 3: *Factors Influencing the Youth in Ado-Ekiti, Ekiti State, Nigeria to Consume Herbal Bitters.*

S/N	VARIABLES	SA	A	U	SD	D	Mean	Standard Deviation	Remarks
8.	One of the main factors influencing youth in Ado-Ekiti's use of herbal bitters is peer pressure from friends and acquaintances.	104	232	45	3	2	1.91	0.70	The majority agree, indicating that the usage of herbal bitters is significantly influenced by peer pressure.
9.	Social media marketing encourages the youth to drink herbal bitters.	116	143	50	15	62	2.39	1.38	The majority of responses are in agreement, suggesting that social media marketing has a moderate impact.
10.	Youth in Ado-Ekiti are motivated to eat herbal bitters because they believe they have therapeutic or medical qualities.	116	201	19	19	31	2.09	1.12	High agreement indicates that the therapeutic or medicinal benefits are widely believed.
11.	The youth use herbal bitters since they are reasonably priced and readily available.	89	212	45	5	35	2.18	1.09	Accessibility and cost are cited as the main drivers of consumption.

12.	Herbal bitters, in my opinion, can enhance my physical attributes and sexual performance.	61	167	66	19	73	2.68	1.33	Moderate belief in claims of improving sexual and physical performance is indicated by mixed replies.
13.	In Ado-Ekiti, social media significantly influence how youth feel about consuming herbal bitters.	69	195	77	12	37	2.34	1.08	There is agreement that young attitudes of herbal bitters are significantly influenced by social media.
14.	My choice to drink herbal bitters is influenced by social media influencers and celebrities.	77	89	15	77	128	3.23	1.58	The majority disagree, indicating that celebrities and social media influencers have little impact.

Note. Author's Field Survey, 2024

Findings in Table 3 confirm the applicability of the Health Belief Model (HBM) and the Theory of Planned Behaviour (TPB) through the identification of important factors influencing the consumption of herbal bitters among youth in Ado-Ekiti. Social media marketing seems to have the least impact on herbal bitters consumer behaviour (mean = 2.39), followed by peer pressure (mean = 1.91), beliefs

concerning therapeutic impact (mean = 2.09), and pricing strategy (mean = 2.18), all of which strongly impact the usage of the product. The impact of celebrity endorsement is minimal, as indicated by a mean score of 3.23, which suggests that the endorsements have little impact on social media campaigns. These findings align with HBM's focus on perceived risks and benefits alongside TPB's attitudes and social norms, focus and perceived

control. To change teenage behaviour employing these theories, health education aimed at altering social norms,

misinformation, peer influence, and education would be required.

Table 4: *Evaluation of Youth's Awareness and Understanding of the Health Dangers Related to the Intake of Herbal Bitters in Ado-Ekiti, Ekiti State, Nigeria.*

S/N	VARIABLES	SA	A	U	SD	D	Mean	Standard Deviation	Remarks
15.	I am aware that consuming too many herbal bitters can harm important organs.	197	158	19	4	8	1.62	0.80	High awareness of the negative consequences of consuming too many herbal bitters is demonstrated by strong agreement.
16.	I understand that consuming herbal bitters carries some danger of addiction.	150	201	15	8	12	1.79	0.86	The majority agree, suggesting a high level of understanding of the dangers of addiction.
17.	A large number of Ado-Ekiti youth are aware that herbal bitters can harm the kidneys and liver.	93	139	77	8	69	2.54	1.36	Moderate awareness of the specific threats to the liver and kidneys is indicated by mixed responses.

18.	Youth in Ado-Ekiti are not well-informed about the dangers of taking big amounts of herbal bitters.	127	166	46	12	35	2.12	1.17	A lack of thorough understanding of the dangers of excessive consumption is suggested by agreement.
19.	Youth in Ado-Ekiti continue to drink herbal bitters because they think they are healthy, even if they are aware of the possible consequences.	124	208	23	12	19	1.95	0.97	High agreement illustrates how health ideas influence continuing usage even in the face of understanding.
20.	Youth in Ado-Ekiti believe they are not given enough information on the health risks associated with herbal bitters.	50	163	77	54	42	2.68	1.19	The responses point to a belief that there is not enough risk-related public health communication.
21.	I am aware that Nigerian health authorities do not give adequate control on herbal bitters even with the issuance of NAFDAC numbers to these products.	154	143	42	12	35	2.04	1.20	A belief in insufficient regulatory control in spite of product approval standards is indicated by agreement.

Note. Author's Field Survey, 2024.

The data analysis in Table 4 supports the applicability of the Theory of Planned Behaviour (TPB) and the Health Belief Model (HBM) by revealing that young

people in Ado-Ekiti have varying levels of awareness regarding the health hazards associated with herbal bitters.

Understanding specific health risks, for example, kidney and liver damage, is moderate (mean = 2.54), which suggests a lack of awareness. However, more primary concerns like organ damage (mean = 1.62) and addiction (mean = 1.79) are well understood. Despite the known risks, a significant number of young people continue to consume herbal bitters (mean = 1.95), which points toward disregard for medical knowledge

and shows that attitudes and beliefs are prioritized over knowledge. There is a pronounced need for targeted education indicated by the lack of public health communication (mean = 2.68). Following TPB and HBM theory assumptions, the results of Table 4 suggest the need for attitude change along with knowledge improvement about specific dangers as well as public health campaigns intended to reduce risky behaviours while boosting health literacy among teens should be the focus of strategies to control the consumption of herbal bitters.

Table 5: *Assessment of the Impacts of Health Information on Youth Addiction to Herbal Bitters, and misinformation in Ado-Ekiti, Ekiti State, Nigeria.*

S/N	VARIABLES	SA	A	U	S	D	Mean	Standard Deviation	Remarks
22.	I think that having access to reliable health information has helped me to use less herbal bitters.	135	174	50	12	15	1.96	0.98	Strong agreement suggests that accurate health information contributes to a decrease in the use of herbal bitters.
23.	Youth usage of herbal bitters has surged in Ado-Ekiti due to misinformation regarding their health advantages.	77	186	58	15	50	2.41	1.23	There is agreement that a major factor in the rise in youth consumption of herbal bitters is misinformation.

24.	The most reliable sources of health information regarding herbal bitters, in my opinion, are medical specialists.	170	169	30	5	12	1.76	0.89	Strong agreement emphasizes how people trust doctors to give them advice about their health.
25.	Youth addiction rates in Ado-Ekiti have surged as a result of false information about the health advantages of herbal bitters spreading on social media.	100	187	54	14	31	2.19	1.11	Misinformation on social media is widely acknowledged to be a major contributor to the rise in addiction rates.
26.	My knowledge of the health hazards connected to the usage of herbal bitters has improved as a result of health education initiatives.	143	173	30	5	35	2.01	1.15	There is a consensus that health education programs are successful in raising people's knowledge of potential health hazards.
27.	My preconceptions regarding the advantages and dangers of consuming herbal bitters have changed as a result of	93	209	46	15	23	2.13	1.02	There is in agreement with the view that the right health information aids in clearing up myths around herbal bitters.

	accurate health knowledge.								
28	I have been able to recognise the early signs and symptoms of herbal bitters addiction through online health awareness.	120	197	50	4	15	1.96	0.92	The importance of internet-based health awareness campaign in spotting early indicators of addiction is highlighted by the strong agreement.

Note. Author's Field Survey, 2024.

Accurate health information significantly impacts adolescent attitudes in Ado-Ekiti towards herbal bitters consumption, as analyzed in Table 5 which aligns with HBM and TPB frameworks. The decrease in herbal bitters consumption has been recorded at (mean = 1.96), showcasing the importance of attitudes and perceived control, which are two of the essential elements of TPB. Overconsumption and addiction due to misinformation are captured through HBM's perceived risks and advantages focus, here accounted as a rise during baseless claims about health benefits (mean = 2.41). Trust in medical experts alongside faith in devoted health education programs highlight the effectiveness pointer (mean = 2.01), whereas trust in experts is recorded (mean = 1.76). Addressing misinformation while improving risk perception utilising

reliable sources suggests fighting addiction while promoting behavioral shifts supports these findings under TPB and HBM frameworks.

Conclusions

This study highlights how important health knowledge is in influencing how young people in Ado-Ekiti, Ekiti State, Nigeria, consume herbal bitters. It applies the Health Belief Model (HBM) and Theory of Planned Behaviour (TPB) frameworks, which hold that core social norms, peer pressure, and misinformation are primary determinants of consumption. Among young people consuming herbal bitters, there is a tendency of developing health problems like addiction and organ damage; however, not much is considered of these risks, such as liver and kidney damage. The findings of this study demonstrate

the need for targeted educational initiatives aimed specifically at rectifying misconceptions and increasing understanding of certain health issues associated with herbal bitters consumption in Nigeria. Even when individuals are aware of certain risks, there are misconceptions surrounding consumption that motivate indiscriminate usage. This study highlights the ineffectiveness of celebrity endorsements and media influence in changing the behaviour of young consumers of herbal bitters in Ado-Ekiti, Ekiti State. On the contrary, adequate and convincing health education is more effective in changing attitudes and promoting healthier choices among the consumers. Social attitudes concerning peer pressure targeted in TPB-focused analysis are contrasted with risk perception improved by HBM-based therapies. Myths dispelling, social norm changes, and provision of accurate information on health matters amongst youth should be prioritized to curb excessive use and avoid addiction. Through approaches based on TPB and HBM frameworks, public health initiatives could improve the healthcare of the youth in Ado-Ekiti by empowering informed decisions through the strategies highlighted in this study.

Recommendations

The following suggestions are made in light of the study's findings: Misconceptions regarding herbal bitters should be debunked through accurate health awareness campaigns; other solutions include fighting peer pressure, and increasing awareness of the risks of herbal bitters consumption, interventions should centre on health education. Improved media outreach and social campaigns that are informed by the Theory of Planned Behaviour can help preventative initiatives and change social norms.

Health education should combat myths surrounding herbal bitters as sustained through peer pressure and societal norms. Access to right information and cost-related policy changes can further lower youth consumption in Ado-Ekiti, Ekiti State, Nigeria.

The study proposes improving education and health literacy initiatives alongside targeted public health communication to fill information gaps, change attitudes towards herbal bitters while also educating the youth on the more severe long-term impacts of liver and kidney damage.

Interventions should improve risk perception, dispel myths regarding herbal

bitters, and offer accurate health information from reputable sources. To facilitate behavioural change, sound communication should always come first—especially in health education—

through the application of relevant frameworks such as the Theory of Planned Behaviour and Health Belief Model.

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