

Jẹ̀dìjẹ̀dì: Cultural Practices, Herbal Medicine, and Unintended Impacts on Dental Caries for Children in Nigeria

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Abstract

This study examines how *jẹ̀dìjẹ̀dì*, an ethnomedical Yoruba construct, shapes dietary behavior. *Jẹ̀dìjẹ̀dì* management often involves sugar avoidance and the use of traditional herbal remedies, practices that may inadvertently reduce childhood dental caries prevalence. The aim of this study, therefore, was to explore how culturally embedded beliefs and practices surrounding *jẹ̀dìjẹ̀dì* in Nigeria influence sugar consumption, exploring the possible unintended oral health benefits of these practices for childhood dental caries prevention. A Community of Practice (CoP) framework was adopted to engage 130 stakeholders—including herbalists, caregivers, community elders, and oral health experts—in a participatory exploration of *jẹ̀dìjẹ̀dì* practices, beliefs, and health implications. Through iterative online discussions, literature reviews, and inductive analysis of the scripts of the discussions, the study identified eight themes connecting traditional health systems to oral health outcomes and policy gaps, namely: (1) *jẹ̀dìjẹ̀dì* as a cultural health construct, (2) *jẹ̀dìjẹ̀dì*, sugar avoidance, and dietary practices, (3) herbal treatments and administration practices, (4) use of *jẹ̀dìjẹ̀dì* remedies in children: practices, beliefs, and safety concerns, (5) sociocultural and gendered interpretations, (6) the link between *jẹ̀dìjẹ̀dì* and oral health, (7) tensions and contradictions, and (8) calls for scientific exploration and policy integration. The analysis reveals a cultural-health ecosystem where *jẹ̀dìjẹ̀dì* beliefs shape dietary and medical practices. While reduced sugar intake may indirectly lower caries rates, unregulated herbal

remedies pose risks. In conclusion, the study highlights the need to bridge traditional practices with scientific research and public health campaigns to harness potential protective dietary behaviors from *jèdijèdí*-related cultural practices on pediatric oral health in Nigeria and address the potential risks from unregulated herbal remedies.

Key words: Traditional medicines; Oral health, Dental caries; Refined carbohydrates; Nigeria

Introduction

Jèdijèdí, a term rooted in Nigerian Pidgin and Yorùbá dialects, refers to hemorrhoids—a condition interpreted through both biomedical and sociocultural frameworks—which is an ethnomedical condition that affects a range of demographics, including age, sex, social class, or status (Olateju, 2009). In Nigeria, cultural health beliefs often attribute *jèdijèdí* to overconsumption of refined sugars and starchy staples (cassava flakes) (Brieger, 1990; Azeez and Isiugo-Abanihe, 2017), or lifestyle factors (De Marco and Tiso, 2021), with a strong preference for herbal medicine over conventional care, particularly in rural regions (Osungunna et al, 2010).

Herbal vendors, often termed "traditional healers" or *onisegun* in Yorùbá communities, occupy a central role in *jèdijèdí* management. Treatments are highly personalized, allowing clients to choose from a variety of mixtures, including the option of having alcohol or water-based *jèdijèdí* drinks (Azeez and Isiugo-Abanihe, 2017). Alcohol-mixed tonics are particularly prevalent, believed to "activate" herbal efficacy (Fasinu et al., 2012). These vendors also serve as informal health educators, advising clients on dietary restrictions (sugary diets and processed foods) and lifestyle adjustments to prevent recurrence.

Notably, *jèdijèdí*'s cultural framing—particularly its association with dietary sugar—may inadvertently influence oral health practices. Herbal vendors' admonitions could indirectly reduce pediatric exposure to cariogenic snacks in households adhering to these norms. This cultural sugar avoidance, combined with limited access to commercial sweets in rural areas (Nordhagen et al., 2019), could contribute to lower dental caries rates in children resident in rural areas.

Studies of dental caries in pre-school children in Nigeria conducted between 2006 and 2023 indicated that dental caries prevalence ranged from 4.3% to 21.2% (Nnawuihe et al., 2025), with an estimated pooled prevalence of 17% (Okolo et al., 2024). One of the identified risk factors for high dental caries experience in preschool children was sugary snack consumption (Nnawuihe et al., 2025). The odds of having dental caries in Nigeria are 18% higher in the group that consumes sugar compared to the group with low sugar intake, and the odds of having dental caries in the primary dentition are also higher in the group that consumes sugar (Akinsolu et al., 2024). Furthermore, the prevalence of dental caries is lower in suburban Nigeria (Nnawuihe et al., 2025), where the belief in *jèdijèdí* and its related practices may be high.

It is notable that the prevalence of ECC in Nigeria is one of the lowest in the world (El Tantawi et al, 2018; WHO, 2020), and is lower than the reports from other countries in Africa such as Namibia (31.69%) (Thopil, 2013), South Africa (44.94% and 51.72%) (Kimmie-Dhansay et al, 2022), Uganda (56%-64%) (Kiwanuka et al, 2004), Kenya (59.5%) (Njoroge et al., 2010), Sudan (52.4%) (Elidrissi and Naidoo, 2016), and Tanzania (20.2%) (Mwakayoka et al., 2017). The reason for this remains unknown. An adduced reason is the high use of high-fluoridated toothpaste: the prevalence of fluoridated

toothpaste use ranges from 81.9% (Olatosi et al., 2020) to 94.8% (Folayan et al., 2015), and from 90.8% to 94.8 % in preschool children 6-71 months old (Folayan et al., 2015; Folayan et al., 2021).

Despite widespread ethnomedical use of *jèdijèdí* remedies and anecdotal associations between traditional sugar-avoidance practices and reduced caries risk, there is a critical gap in empirical research linking these cultural practices to measurable oral health outcomes. Specifically, no studies have examined how the dietary and herbal health behaviours associated with *jèdijèdí* beliefs may inadvertently influence pediatric oral health, particularly concerning sugar consumption and dental caries risk. Furthermore, the safety and frequency of *jèdijèdí*-related herbal remedy use in children remain poorly understood and undocumented. These observations raise critical questions: Does cultural avoidance of refined carbohydrates, linked to *jèdijèdí* aetiology, offset dental caries risk? Or do the bioactive properties of traditional herbs inadvertently protect oral health?

***Jèdijèdí* and the cultural phenomenon**

Herbal remedies for *jèdijèdí* are generally used intermittently rather than as part of a daily regimen, which potentially limits continuous exposure to cariogenic factors. Bitter herbs, such as bitter leaf, are frequently employed as remedies after sugar consumption because of their ability to lower blood glucose and inhibit starch-hydrolyzing enzymes and lipolysis (Jugran et al., 2021). This highlights the need for further investigation into how *jèdijèdí*-related dietary practices influence broader family eating behaviors. For example, do caregivers who avoid sugar to prevent *jèdijèdí* also restrict children's access to cariogenic snacks? Is the avoidance of sugar linked to reduced caries risk, or are other factors, such as genetics, microbiome composition, or socioeconomic status, more influential? In addition, do the bioactive compounds in *jèdijèdí* herbs affect *Streptococcus mutans* or alter enamel demineralization risks? Thorough studies are necessary to explore this complex relationship, considering the scale of its impact. Answering these questions will require interdisciplinary collaboration.

The intersection between *jèdijèdí* beliefs and oral health presents a valuable opportunity to merge cultural practices with contemporary dental science. By situating *jèdijèdí* within this framework of belief, health practices, and social disparities, researchers can uncover its paradoxical role in shaping population health outcomes, including the surprisingly low incidence of childhood caries. This broader perspective not only positions *jèdijèdí* as a treatment for hemorrhoids but also as a deeply ingrained cultural practice with far-reaching implications for nutrition, health equity, and intergenerational health, offering valuable insights for caries prevention across diverse settings.

Engaging with traditional healers and local communities allows researchers to develop interventions that respect cultural practices while safeguarding children's oral health—a model of integrative care with global applicability. This approach redefines *jèdijèdí* not just as a cultural health practice but as a lens through which to examine how ethnomedical beliefs unintentionally shape population health outcomes. It highlights Nigeria's ethnomedical landscape, where health-seeking behaviours are influenced by cultural beliefs and socioeconomic contexts. The management of *jèdijèdí*, rooted in personalized herbal remedies and spiritual pragmatism, embodies a resilience-focused approach to healthcare in resource-constrained environments. Understanding these dynamics is crucial for crafting public health strategies that respect cultural traditions while addressing unintended consequences, such as disparities in oral health. The aim of this study, therefore, was to explore how culturally embedded beliefs and practices surrounding *jèdijèdí* in Nigeria influence sugar consumption and explore the possible unintended oral health benefits of these practices for childhood dental caries prevention.

Methods

A Community of Practice (CoP) approach was adopted to explore the cultural, social, and health dimensions of *jẹ̀dìjẹ̀dì* in Nigeria, aiming to further understand the dynamics of oral health and *jẹ̀dìjẹ̀dì*. This approach allows researchers to ground their understanding in lived experiences, cultural expressions, and everyday practices (Wenger, 1988). It can reveal the cultural expressions, rituals, and practices that are embedded within a particular community, enabling researchers to understand the cultural nuances that shape individual and collective behavior (Wenger, 1988).

For this study, the CoP approach enabled collaborative knowledge generation through iterative dialogue with individuals who possess lived experience, traditional expertise, and cultural authority. In the absence of formal documentation linking *jẹ̀dìjẹ̀dì* to oral health, the CoP served as a dynamic platform to contextualize *jẹ̀dìjẹ̀dì* as a culturally embedded health belief system, uncover tacit knowledge related to dietary practices and herbal remedy use, and amplify community voices in bridging biomedical and traditional health paradigms.

The dialogue of the CoP aimed to reveal how the management of *jẹ̀dìjẹ̀dì* functions, not only as a response to illness, but also as a broader health belief system that uncovers its unspoken influence on dietary behaviour, which can reduce the rate of childhood caries, offering culturally informed insights for oral health promotion in similar underserved settings. Ethics clearance for the study was obtained from the Institute of Public Health, Obafemi Awolowo University, Ile-Ife, Nigeria (IPH/OAU/12/2742).

The group was created on the 13th of August, 2024. Invitations to participate in the CoP were sent out through social media and during public engagements. The platform remained open to interested individuals. Before joining, prospective participants engaged in a brief introductory chat via WhatsApp, during which they were asked to share their motivation for participation. Only individuals who indicated a desire to contribute perspectives on Yorùbá culture and oral health were included in the group. Those whose interest was limited to herbal remedies or passive observation were not admitted. The final group included a diverse range of participants—cultural scholars, oral health professionals, community leaders, philosophers, and others with deep knowledge of Yorùbá traditions and practices. At the beginning of the dialogue, there were 130 people on the platform.

The discussion happened in three phases between the 8th and 23rd of March 2025. The first phase focused on building trust and fostering co-learning through storytelling and collaborative mapping of *jẹ̀dìjẹ̀dì* symptoms and causes. The collaborative learning process included discussions on eight shared manuscripts and documents on *jẹ̀dìjẹ̀dì*. The summary of the papers discussed is highlighted in Table 1.

Table 1: Summary of papers reviewed on *jẹ̀dìjẹ̀dì* by members of the Community of Practice

Details of the manuscript	Summary of content on <i>jẹ̀dìjẹ̀dì</i>
Johnson O, 1889	A dissertation which provides an account of traditional medical practices among West Africans, particularly the Yorùbá. He emphasizes the empirical knowledge of local healers, who, despite lacking formal education, effectively utilized herbal remedies based on observed efficacy and cultural understanding. The thesis does not explicitly discuss <i>jẹ̀dìjẹ̀dì</i> . His work underscores the importance of integrating traditional knowledge into broader

	medical discourse, highlighting the potential benefits of acknowledging and studying culturally specific health beliefs and treatments.
Soladoye et al., 2010	This ethnobotanical study documents the use of 143 plant species from 58 families by traditional healers in southwestern Nigeria to treat hemorrhoids, reflecting indigenous Yorùbá medicinal practices likely tied to the broader <i>jèdijèdí</i> healing tradition. Herbalists emphasized specific preparation methods and recommended dietary changes, such as avoiding stimulants and consuming medicinal vegetables and herbs. While <i>jèdijèdí</i> is not explicitly named, the study advocates for the integration of traditional knowledge into modern healthcare and the conservation of medicinal plant heritage.
Oreagba et al., 2011	<i>Àgbò jèdijèdí</i> , used by 35% of participants, is a culturally entrenched herbal remedy in Lagos made from scented leaves, bitter leaf, grapefruit juice, sorghum leaves, garlic, and naphthalene. Often taken for general well-being, its use is driven by social influence, with 78.4% relying on family and friends. While 58% consider it safe due to its natural origin, 20.8% reported mild side effects. The study highlights concern over standardization and safety, urging clinical trials, regulation, and public education.
Brimah and Adigun, 2014	With 80% of respondents reporting experience of <i>jèdijèdí</i> , the study suggests possible links to metabolic syndrome, sucrose intolerance, or fructose malabsorption. It calls for biomedical validation and integration of traditional knowledge, highlighting <i>jèdijèdí</i> as an important, yet overlooked, intersection of culture and health that reflects broader gaps in global healthcare systems.
Azeez and Isiugo-Abanihe, 2019	This mixed-methods study explores cultural beliefs and treatment of <i>jèdijèdí</i> in Oyo State, Nigeria, revealing its association with diet, sexual dysfunction, and a strong reliance on herbal remedies, especially among men. Misconceptions and gendered stigma drive traditional practices, often conflicting with biomedical understanding. The study calls for public education and integration of traditional and modern care to reduce misdiagnosis and improve health outcomes.
Alabi and Aliyu, 2022	This ethnographic study examines neonatal care in Akinlalu, Nigeria, revealing a cultural belief in <i>jèdijèdí</i> —a folk illness linked to sugary diets in mothers—as a cause of infant ailments. Traditional remedies contrast with biomedical views, which perceive <i>jèdijèdí</i> as a vague term for various conditions. The disconnect between cultural and medical interpretations may hinder timely healthcare, highlighting the need for culturally sensitive health education to improve neonatal outcomes.
Daramola et al., 2023	This study examines the perception and use of <i>àgbò jèdijèdí</i> , a traditional herbal remedy for hemorrhoids and sexual dysfunction among adult males in Ibadan, Nigeria. Despite high levels of formal education among participants, herbal medicine remains widely trusted for its affordability, perceived effectiveness, and cultural relevance. Many men prepare these remedies themselves or obtain them from both authorized and unauthorized sources. Cultural stigma surrounding sexual health contributes to underreporting, with herbal treatments offering a discreet alternative to biomedical care. The study calls

	for the regulation and standardization of such widely used remedies, emphasizing the importance of integrating trusted traditional practices into the formal healthcare system.
Akinboro et al., 2023	This study assesses the safety of <i>àgbò jẹ̀dìjẹ̀dì</i> . It is often self-prepared or purchased from informal vendors. While low doses in rats promoted cell division with minimal organ damage, high doses caused DNA damage and abnormal sperm morphology, suggesting mutagenic and toxic effects. The dual nature of its phytochemicals—antioxidant at low levels but harmful at high concentrations—underscores the potential risks of unregulated use. These findings highlight the urgent need for regulatory oversight and public education.
Arogundade et al., 2024	This study explores treatment patterns for <i>jẹ̀dìjẹ̀dì</i> in Ekiti State, Nigeria, where 74.6% prefer traditional herbs over biomedical care. Key factors include affordability, social influence, and gender. While <i>jẹ̀dìjẹ̀dì</i> is culturally recognized, its vague definition complicates medical treatment. The study calls for safety testing of herbal remedies and culturally sensitive health education to bridge gaps between traditional and biomedical care.

During the second phase, which was held over two weeks, the CoP convened to explore the interconnections between traditional Yorùbá cultural beliefs and practices related to *jẹ̀dìjẹ̀dì* and sugar consumption, the prevalence of dental caries in children, and the use of herbal remedies. The discussions were facilitated by MOF (first author), who served as moderator and led the group through structured, participatory dialogue sessions of case studies on parental practices, herbal regimens for children, and the generational transmission of dietary habits. The facilitation strategies emphasized reflexivity, collaborative dialogue, and cultural anchoring. Open-ended questions encouraged active engagement, while iterative summaries and culturally resonant content helped bridge traditional knowledge with contemporary oral health discourse.

Participants were first introduced to key ideas that emerged from the discussions of the background manuscript and asked to reflect on their understanding of the links between oral health and cultural expressions. Summaries of the daily discussions were shared at the end of the day, and new questions were raised for discussion on the next day. Daily sessions of the CoP were thematically focused. In the initial sessions, participants explored their experiences and understanding of *jẹ̀dìjẹ̀dì*, and how this underpins continued reliance on traditional remedies used to treat the ‘disease’. The sessions included discussions on local dietary restrictions, home-based treatments, and the broader communal efforts to prevent and or treat *jẹ̀dìjẹ̀dì*.

The second phase of discussions focused on participants’ perceptions of the effectiveness of herbal remedies in preventing or treating *jẹ̀dìjẹ̀dì*. Participants shared personal experiences and engaged in collective reflection on the validity of these claims. The conversations also delved into the methods of preparing the herbal remedies, as well as the typical dosages used for both preventive and therapeutic purposes.

In the third phase of discussions, participants turned to the topic of dental caries in childhood, interrogating the extent to which preventing or treating *jẹ̀dìjẹ̀dì* could have an impact on the risk of

dental caries in children. CoP members also engaged in collaborative sense-making by reviewing preliminary findings, resolving contradictions, and co-creating narratives to illustrate *jẹ̀dìjẹ̀dí*'s role in oral health behavior.

An inductive thematic analysis was conducted. An inductive analysis of community perspectives on *jẹ̀dìjẹ̀dí* is essential to contextualize the phenomenon in the absence of formal documentation. Eight themes were identified, namely: (1) *jẹ̀dìjẹ̀dí* as a cultural health construct, (2) *jẹ̀dìjẹ̀dí*, sugar avoidance, and dietary practices, (3) herbal treatments and administration practices, (4) use of *jẹ̀dìjẹ̀dí* remedies in children: practices, beliefs, and safety concerns, (5) sociocultural and gendered interpretations, (6) the link between *jẹ̀dìjẹ̀dí* and oral health, (7) tensions and contradictions, and (8) calls for scientific exploration and policy integration. The analysis reveals a cultural-health ecosystem where *jẹ̀dìjẹ̀dí* beliefs shape dietary and medical practices. While reduced sugar intake may indirectly lower dental caries rates, unregulated herbal remedies pose risks.

Results

THEME 1: *Jẹ̀dìjẹ̀dí* as a Cultural Health Construct: *Jẹ̀dìjẹ̀dí* is widely understood within Yorùbá communities in Nigeria as a culturally embedded syndrome, rather than a strictly biomedical diagnosis. Descriptions of the condition consistently portray it as a constellation of symptoms affecting multiple body systems, including back pain, anal discomfort, bloody stools, constipation, frequent flatulence, and erectile dysfunction. As one community participant noted, capturing the multi-symptom nature of the condition, “*I know jẹ̀dìjẹ̀dí by its symptoms: when one can't defecate with ease, when one pollutes frequently, when one has waist pains, when a man battles with weak erection*” (CoP 8),

Unlike formal clinical syndromes, *jẹ̀dìjẹ̀dí* blends physical complaints with cultural interpretations of imbalance, excess, and impurity, often linked to dietary habits or spiritual causes. It is seen as a condition that defies social stratification, reinforcing its universality through proverbs like “*jẹ̀dìjẹ̀dí kò mọ̀ akòwé*” — translated as “*jẹ̀dìjẹ̀dí does not respect the educated*” — suggesting that even those with formal education and biomedical knowledge are not immune to its perceived effects (CoP 10).

This inclusive framing positions *jẹ̀dìjẹ̀dí* as a culturally legitimate and socially resonant health category, embedded in everyday language, health-seeking behavior, and preventive practices. Importantly, its syndromic framing reflects a broader understanding of health and illness in Yorùbá culture, where disease is not merely the presence of pathology but a disturbance of bodily, dietary, or spiritual balance. As such, *jẹ̀dìjẹ̀dí* functions both as a diagnostic label and a culturally mediated explanation of suffering, shaping how individuals understand symptoms, attribute causes, and seek remedies, including dietary adjustments and the use of herbal medicine.

In the absence of formal clinical definitions, *jẹ̀dìjẹ̀dí* exemplifies how local knowledge systems create meaningful categories of illness that, while often dismissed by biomedical discourse, carry significant weight in guiding behavior and public health outcomes.

THEME 2: *Jẹ̀dìjẹ̀dí*, Sugar Avoidance, and Dietary Practices: The cultural framing of *Jẹ̀dìjẹ̀dí* as an ailment linked to diet, particularly the consumption of sugar, starchy foods, and spicy ingredients, emerges strongly in community narratives. Participants widely perceive sugary and refined foods as direct triggers of *jẹ̀dìjẹ̀dí* symptoms, reinforcing a long-standing tradition of dietary caution. This belief

system, deeply rooted in Yorùbá health culture, has cultivated a generational avoidance of sugar and other “heating” or “body-spoiling” foods, particularly among men who associate *jẹ̀dijẹ̀dí* with weakness or sexual dysfunction.

One respondent reflected this belief plainly: “Yorùbás believe that *jẹ̀dijẹ̀dí* can weaken man's power, and that's why many of us run away from sugar and take herbal concoctions like *agunmu*” (CoP 8). Such statements highlight that sugar is not merely seen as a dietary indulgence but as a health risk that disrupts bodily balance and masculine vitality.

Importantly, these beliefs are not abstract; they actively shape household behaviors and intergenerational dietary norms. One participant noted that “Growing up, my dad would squeeze bitter leaf water and scent leaf water after we had eaten too much [sic] sweet things,” suggesting that children were regularly conditioned to associate sugar with illness and bitter herbs with cleansing or correction (CoP 9). This ingrained association underscores the preventive ethos within the *jẹ̀dijẹ̀dí* framework, where herbal interventions are not just curative but also regulatory.

The influence of these practices extends beyond individual belief to structured family-level behavior modification. The continued avoidance of sugar in the home and the use of bitter herbal remedies in response to children's sweet consumption illustrate how *jẹ̀dijẹ̀dí* beliefs function as a cultural dietary filter, influencing not only adult health behaviors but also shaping children's exposure to dental caries-associated foods. As one caregiver summarized, “We don't use sugar at home, but when the children take sweet things, I give them bitter leaf and scent leaf water to drink” (CoP 9).

These insights support the hypothesis that *jẹ̀dijẹ̀dí* beliefs may inadvertently contribute to reduced sugar consumption and possibly lower rates of dental caries in Nigerian children. In the absence of formal oral health programs or widespread access to fluoride, such cultural beliefs may serve as unintentional protective mechanisms, influencing dietary patterns in ways that align with modern preventive dentistry.

The avoidance of sugar rooted in *jẹ̀dijẹ̀dí* beliefs reflects a complex interplay of health perception, cultural logic, and household regulation. Understanding and leveraging this belief system could provide culturally resonant pathways for oral health promotion, particularly in settings where biomedical narratives have limited reach.

THEME 3: Herbal Treatments and Administration Practices: The use of herbal remedies such as *Àgbò jẹ̀dijẹ̀dí*, *agunmu* powders, *ọ̀ pá ẹ̀ jìn*, and various topical preparations remains deeply entrenched in Yorùbá ethnomedicine as a primary response to managing *jẹ̀dijẹ̀dí*. These treatments are culturally validated and widely accessible, offering practical and symbolic solutions to a condition perceived to be caused by “bad” foods, especially excessive intake of starches and sugars. As one participant affirmed, “*Àgúnmu-jẹ̀dí* is a well-known herbal dose for hemorrhoids from time immemorial in the Yorùbá parlance” (CoP 14), highlighting the deep historical continuity of these practices.

Preparation and administration methods of *agunmu-jẹ̀dí* vary. Some remedies are consumed as drinks (*agbo*), while others are applied topically; in some cases, smoked or used as soaps. The flexibility in usage reflects both personalization and the improvisational nature of indigenous medicine. For instance, *ọ̀ pá ẹ̀ jìn*, a tree bark-based remedy, is consumed in both alcohol and water preparations,

with personal and contextual preference shaping the form chosen (CoP 6). Preventive administration is also common; children are routinely given preparations such as *kafura* and water, administered based on maternal or grandmaternal discretion (CoP 3). These remedies are not only used to treat symptoms but are often given prophylactically after perceived dietary transgressions. “*After eating too much rice, you have to drink Agbo,*” said one respondent (CoP 15), echoing the belief that herbal cleansing is necessary to restore bodily balance.

Importantly, the use of herbal remedies extends beyond health—it reflects structural realities. Many men, particularly those aged 20–39 and from lower-income backgrounds, turn to herbal vendors to avoid the stigma associated with seeking clinical care, especially for symptoms such as anal pain or erectile dysfunction (COP 1). Herbal vendors, therefore, serve as both therapeutic agents and custodians of cultural trust.

However, concerns about safety, efficacy, and standardization persist. Although anecdotal success stories abound—such as a child’s symptoms resolving after treatment with *ewé ejìnrìn* (CoP 16) or weekly use of *àgbo* preventing symptoms in adults (CoP 12)—real risks are associated with inconsistent preparation methods. As CoP 3 notes, “*Herbal vendors mix remedies with alcohol for preservation, risking dependency,*” while COP 2 warns that “*Àgbo jèdijèdí lacks standardization; overdosing causes gastrointestinal issues.*” Alcohol-based formulations have also raised alarms about long-term health effects, including oral cancer risk, prompting calls for safer, water-based alternatives (COP 4).

Interestingly, some traditional remedies offer indirect oral health benefits. Natural toothbrushes such as neem sticks and bitter leaves, often associated with *jèdijèdí* prevention, may also contribute to reduced dental caries among children (CoP 14). This unintentional overlap between ethnomedical and dental hygiene practices underscores the need for further investigation.

In effect, herbal treatments for *jèdijèdí* reflect a complex interplay of cultural beliefs, accessibility, perceived efficacy, and structural health inequities. While widely trusted and used, their unregulated nature presents opportunities for scientific exploration as well as challenges for public health safety. Understanding this landscape is crucial for integrating culturally relevant oral health interventions and ensuring community safety.

THEME 4: Use of *Jèdijèdí* Remedies in Children: Practices, Beliefs, and Safety Concerns:

The administration of *àgbo jèdijèdí* to children often begins in the neonatal period as a preventive health measure. COP 4 shared that “*For neonates, I administer àgbo jèdijèdí immediately after birth as a preventive measure*”. Her regimen involves giving the decoction every other morning for the first four weeks of life, with use discontinued thereafter unless symptoms recur. This practice, she noted, is widespread when mothers consume starchy foods such as *àmàlà* (yam flour) or *ỳyàn* (pounded yam) during lactation, which are believed to predispose infants to *jèdijèdí*.

In later life, cultural responses to sugar intake continue to influence treatment practices. One parent (CoP 9) recalled, “*Now, when my children take sweet things, I give them bitter leaf and scent leaf water to drink.*” This reflects an inherited belief that bitter herbs can counteract the effects of sugar, thus preventing symptoms associated with *jèdijèdí*.

In addition, topical applications are used, particularly for oral health. According to another respondent (**CoP 11**), “*For children, most mothers use cotton wool and put 2–3 drops of bòtùje leaf liquid to brush their child’s teeth.*” This practice is believed to prevent sugar-related dental issues and maintain oral cleanliness.

From a curative standpoint, **CoP 3** noted that traditional remedies are administered for as long as symptoms persist. “*Infants continue to receive kafura (camphor-infused remedies) and water for as long as their mothers or grandmothers deem necessary, based on perceived persistence of symptoms,*” he observed. Such decisions are typically guided by maternal or elder experience rather than clinical indicators.

Even commonly accepted ingredients such as bitter and scent leaves carry potential risks when overused. **COP 4** warned, “*Overuse of bitter leaves or scent leaves could lower blood pressure or cause digestive issues in children.*” This underscores the thin line between therapeutic and harmful doses, one that is often poorly defined.

COP 2 highlighted the underlying issue of variability: “*Àgbò jẹ̀ `dìjẹ̀ `dì preparations vary widely in composition and dosage. Misuse or overuse poses risks, especially for children with immature intestinal systems.*” Her statement reinforces growing concerns about the lack of standardized formulations or validated dosage guidelines.

Beyond direct administration, dietary customs also play a preventive role. A caregiver (**CoP 10**) explained, “*Yorùbá families avoid sugary snacks like èpà olóyìn (sugar-coated groundnuts) and balewa (chalk-like sweets) due to fears of jẹ̀dìjẹ̀dì and tooth decay.*” This dietary restraint may provide indirect benefits for oral health, even though it stems from traditional health beliefs.

Yet, critical gaps remain. Dosing practices are almost entirely based on familial traditions or the discretion of herbalists and lack scientific validation. Furthermore, symptoms such as constipation or anal protrusion (*ìdí yíyò*) in children are frequently misinterpreted as *jẹ̀dìjẹ̀dì*, which may delay effective biomedical diagnosis and care.

THEME 5: Sociocultural and Gendered Interpretations: The sociocultural framing of *jẹ̀dìjẹ̀dì* reflects deeply gendered health narratives that influence both the perception and management of the condition within Nigerian communities. Predominantly, *jẹ̀dìjẹ̀dì* is constructed as a male-centered affliction, often linked to sexual dysfunction, weakened virility, and infertility. This association reinforces societal emphasis on male sexual performance and reproductive capacity as critical health concerns. As one participant noted, “*jẹ̀dìjẹ̀dì is believed to affect men’s performance and fertility... It’s thought to cause impotence or weakness in men*” (**CoP 13**), capturing the entrenched view that *jẹ̀dìjẹ̀dì* is a threat to male masculinity.

However, this dominant narrative is contested by voices within the community, particularly from women, who highlight the broader health implications of *jẹ̀dìjẹ̀dì* for females. Women participants pointed to experiences of menstrual irregularities, infertility, and complications during childbirth as consequences of *jẹ̀dìjẹ̀dì*, thereby challenging its exclusive association with male bodies. As **CoP 6** shared, “*They said when women have jẹ̀dìjẹ̀dì, it causes infertility,*” indicating that *jẹ̀dìjẹ̀dì* is also implicated in reproductive health concerns for women. Another participant emphasized the role of diet, specifically sugar consumption during pregnancy, as a contributing factor to difficult deliveries: “*Some women who love consuming sweet things during pregnancy... give birth to large babies and find it difficult to deliver*” (**CoP 11**).

These gendered interpretations of *jèdijèdí* reflect broader socio-medical constructions of illness in Nigeria, where cultural beliefs intersect with gender roles, reproductive expectations, and food taboos. The narratives demonstrate that while *jèdijèdí* is commonly understood through a male lens, it also serves as a culturally resonant explanation for various female reproductive health issues. Recognizing and unpacking these dual gendered meanings is essential not only for understanding how *jèdijèdí* shapes health behavior but also for designing equitable health interventions that are responsive to the lived realities of both men and women.

THEME 6: Link Between *jèdijèdí* and Oral Health: The cultural construct of *jèdijèdí*, widely recognized in Yorùbá communities, may unintentionally contribute to improved oral health outcomes in children through culturally driven sugar avoidance and herbal practices. While *jèdijèdí* is traditionally perceived as a condition caused by excessive consumption of sugar, starchy foods, and processed sweets, this belief system appears to have triggered intergenerational dietary caution, particularly in households with young children.

Participants described personal and familial behavioral changes stemming from *jèdijèdí* prevention efforts, such as long-term sugar avoidance, substitution of sweets with herbal decoctions, and the use of bitter leaves or salt water rinses following sugar intake. One respondent stated, “*I stopped sugar for 20 years to avoid jèdijèdí; my children take àgbò after sweets,*” underscoring the long-standing behavioral shifts linked to this belief. Another participant noted, “*Families avoid sweets like èpà olóyìn and bàlẹ̀nà to prevent jèdijèdí and tooth decay,*” directly tying the avoidance of culturally popular confections to both *jèdijèdí* prevention and oral health benefits.

Crucially, these practices align with known public health strategies for dental caries prevention. Reduced sugar intake is globally recognized as a primary protective factor against dental caries, and in this context, the cultural rationale for avoiding sugar, though not initially rooted in oral health education, achieves a similar outcome. As **COP 1** aptly summarized, “*This belief could play a role in lower dental caries prevalence in Nigeria, as reduced sugar consumption is a known preventive measure.*”

Furthermore, the routine use of traditional herbs, such as *bòtùje* and *scent leaf*, either as oral rinses or tooth-cleaning agents, may reinforce oral hygiene practices within these communities. One caregiver explained, “*There is a leaf called bòtùje in Yorùbá... most mothers use cotton wool and put drops on their child’s bush [toothbrush].*” Although the efficacy of these substances in preventing dental caries has not been formally established, their bitter, antimicrobial nature may offer some protective benefits, similar to how traditional chewing sticks have been shown to aid in plaque removal.

The narrative that “*Children under 5 who eat a lot of sugar complain of stomach pains... it also causes weakness of teeth and holes in them*” further supports the embedded oral health consciousness in community health beliefs. While this understanding does not directly mirror biomedical explanations of caries etiology, it provides a culturally coherent logic that promotes protective health behaviors.

Overall, the intersection of *jèdijèdí* beliefs and oral health presents a compelling case for culturally grounded public health approaches. Traditional belief systems, often viewed as barriers to modern care, may function as allies in preventive health if recognized and integrated thoughtfully. These findings encourage oral health policymakers and practitioners to explore and engage with indigenous knowledge as part of a broader strategy for reducing childhood caries and promoting community-led behavior change.

THEME 7: Tensions and Contradictions: A recurring theme in the Community of Practice discussions was the tension between traditional beliefs surrounding *jèdijèdí* and the perspectives of orthodox medicine. Participants expressed concern over what they perceived as the dismissal of culturally rooted practices by biomedical professionals. As one participant remarked, “*Orthodox medicine is skeptical about jèdijèdí, but tradition says otherwise—why the divide?*” (COP 20), highlighting the epistemological rift between indigenous knowledge systems and Western medical frameworks.

This divide is not merely academic; it manifests in practical health decisions. While some participants acknowledged the symptomatic relief provided by traditional remedies like *àgbò jèdijèdí*, they also recognized the limitations of these treatments. “*Àgbò jèdijèdí relieved my symptoms temporarily, but surgery was the real cure,*” shared COP 2, illustrating a pragmatic synthesis of traditional and biomedical care.

Yet, labeling all *jèdijèdí* practices as “quackery” was strongly contested. One participant cautioned against dismissive attitudes, stating, “*Calling all jèdijèdí practices ‘quackery’ ignores centuries of Yorùbá healing wisdom*” (COP 19). This tension reflects a broader struggle over legitimacy and power in health discourse, where biomedical dominance often invalidates indigenous knowledge without sufficient investigation or engagement.

These contradictions highlight the need for an integrative approach that neither romanticizes tradition nor blindly privileges modernity. Bridging this gap calls for respectful dialogue, empirical inquiry into herbal remedies, and culturally sensitive health messaging that honors community beliefs while ensuring safety and efficacy.

THEME 8: Calls for Scientific Exploration and Policy Integration: The Community of Practice (COP 5) revealed a strong and recurring call for scientific validation of traditional herbal remedies used for treating *jèdijèdí*. Participants emphasized the need for rigorous pharmacognostic research to identify the active compounds in commonly used formulations such as *àgbò jèdijèdí* and to assess their clinical efficacy. As COP 2 aptly questioned, “*What is the pharmacognosis of the jèdijèdí herbs? What are the healing effects? Does it relate to sugar or not?*” This reflects an awareness of the gap between cultural usage and biomedical validation—a gap that, if bridged, could enhance both scientific understanding and community trust in public health interventions.

Furthermore, the unregulated nature of herbal medicine in Nigeria poses significant risks. Concerns such as liver damage caused by unstandardized ingredients, particularly alcohol-based formulations, have been raised (Rani et al, 2024). CoP 7 highlighted inconsistencies in NAFDAC’s regulation of herbal products, reinforcing the urgent need for safety evaluations and regulatory frameworks. These risks underscore the importance of initiating controlled clinical trials to assess both the efficacy and safety profiles of these remedies. Oduwolé added, “*We need clinical trials to validate àgbò jèdijèdí’s efficacy and standardize dosages,*” advocating for a harmonized approach that respects traditional knowledge while adhering to biomedical standards.

Despite the lack of a direct link in folklore between *jèdijèdí* and dental caries, participants suggested that the cultural aversion to sugar, rooted in *jèdijèdí* beliefs, may contribute to reduced sugar intake and, consequently, lower rates of childhood dental caries. COP 1 observed, “*These remedies are used to treat and prevent the symptoms after starch and sugar are consumed. Could this explain Nigeria’s low dental caries*

rates?" This hypothesis invites further interdisciplinary research into how traditional dietary norms may inadvertently support modern oral health goals.

Critically, several contributors emphasized the potential for traditional knowledge to inform oral health policy. If validated, *jèdijèdí* herbal practices could be strategically integrated into culturally resonant public health campaigns. However, as **CoP 5** noted, "*integration into campaigns is complex*," especially given the varied interpretations and formulations across communities. Therefore, policy integration must be approached with cultural sensitivity, scientific rigor, and regulatory oversight.

This theme underscores the community's openness to aligning traditional practices with scientific evidence, advocating for research, regulation, and thoughtful integration into oral health strategies. Validating these practices not only enhances public health impact but also preserves indigenous knowledge systems that have long shaped health behaviors in Nigeria.

Discussion

The current study findings highlight that *jèdijèdí* is deeply rooted in the cultural and therapeutic traditions of Southwest Nigeria. A review of eight studies on *jèdijèdí* reveals a consistent reliance on herbal remedies such as *àgbò jèdijèdí* across diverse populations in Southwest Nigeria. These remedies are deeply rooted in cultural belief systems, with motivations for use including perceived safety, affordability, accessibility, and social influence. It is either self-prepared or sourced from informal vendors (Oreagba et al., 2011; Daramola et al., 2023).

Despite the expanse of literature exploring cultural perceptions and the general health implications of *jèdijèdí*, there is a striking absence of research into its impact on oral health. Yet, the frequent use of bitter or acidic herbal ingredients to prepare the *àgbò jèdijèdí*, the addition of additives like naphthalene into the preparations, and the underreporting of adverse effects (Oreagba et al., 2011; Brimah and Adigun, 2014) suggests the potential of the remedy to harm oral tissues and affect enamel integrity and periodontal health—risks that remain entirely unexplored in existing studies.

Likewise, references to pediatric exposure to *àgbò jèdijèdí* are minimal. Although Alabi and Aliyu (Tayo and Aliyu, 2022) noted that traditional beliefs linking maternal diet to infant illnesses are framed as *jèdijèdí*, no studies have directly examined the safety or use of these remedies in children. This lack of data has critical implications. Without knowledge of how *jèdijèdí* may affect the mouth or its dosing for use in children, harmful practices may go unchecked, particularly given its widespread, unregulated use. While traditional *jèdijèdí*-related practices may offer some benefits, such as reducing sugar intake and reinforcing oral hygiene, there are significant risks associated with the unregulated use of herbal remedies, especially in children. The use of alcohol-based decoctions, inconsistent dosing, and the potential for herb-induced side effects call for urgent attention. Regular consumption, especially at high doses, could lead to cumulative oral damage or obscure more serious dental conditions due to delayed clinical presentation. The evidence generated from the current study suggests that the use in newborns is for a short period of about four weeks, and its preventive use seems to be one-off after the consumption of a high-dose sugary diet. Notwithstanding, there is an urgent need for targeted research into the oral health consequences and pediatric safety of *jèdijèdí* therapy.

Equally important is the development of culturally sensitive public health education and regulatory oversight to ensure the safe use of traditional remedies within contemporary health frameworks. While *jèdijèdí* remains a vital part of Nigerian ethnomedicine, a holistic approach that bridges traditional

knowledge with modern science is essential to safeguard public health. The widespread trust in *jèdijèdí* is largely based on its natural origins, which are often equated with safety, despite a lack of formal regulation or clinical validation (Akinboro et al., 2023; Arogundade et al., 2024). Yet, the assumption of safety is poorly founded (Oreagbo et al., 2011; Brimah and Adigun, 2014; Akinboro et al., 2023) with the potential to negatively affect oral tissues, such as enamel erosion, or cause delayed dental care seeking due to reliance on traditional remedies. Its low frequency of use in children is also not enough to provide therapeutic benefits for caries prevention, as dental caries prevention requires prolonged low-dose topical exposure to anticariogenic agents like fluoridated toothpastes, or regulated exposure to high concentrations of anticariogenic agents like professional topical fluoride applications.

However, the cultural belief in *jèdijèdí* can drive dietary changes. Strengthening the health promotion messages of traditional health providers and herbalists may serve as a powerful catalyst for positive dietary changes within communities. For instance, parents and caregivers, motivated by the fear of *jèdijèdí* developing in children, often proactively restrict the consumption of refined sugars, processed snacks, and artificially sweetened drinks. This preventive behavior, while culturally framed, has unintended public health benefits, particularly in reducing the risk of early childhood caries, obesity, and other metabolic conditions. This presents a unique opportunity for public health actors to engage with traditional health belief systems not as obstacles but as strategic entry points for co-designed interventions. Traditional health providers and herbalists, who possess considerable influence and trust within their communities, are often the first point of contact for child health concerns. Their advice is typically sought before pursuing biomedical care, especially for conditions perceived to be culturally rooted.

To harness this trust and reach, the health promotion messages delivered by these traditional practitioners may need to strengthen both the content and the communication approach. For example, rather than dismissing beliefs around *jèdijèdí*, health campaigns can be designed to work alongside them, helping traditional providers share accurate, evidence-based information about the health risks of excessive sugar intake, the importance of regular oral hygiene, and the potential side effects of overusing herbal decoctions, especially in children.

Strengthening these messages may involve co-training initiatives where traditional healers are offered participatory education sessions alongside biomedical practitioners. This would allow them to retain cultural authority while improving the accuracy and safety of their guidance. Materials can be co-developed in local languages, incorporating metaphors and imagery familiar to both the healer and the community, for instance, linking *jèdijèdí* with the biomedical concept of gut inflammation or excess sugar fermenting in the mouth and gut. Ultimately, by bridging traditional health systems with formal public health communication strategies, we can create a more culturally anchored and sustainable model for child health promotion — one that reduces the risks associated with herbal overuse, while leveraging long-standing beliefs to reinforce health-positive behaviors such as limiting sugar intake, increasing water consumption, and maintaining oral hygiene.

The current study findings strongly emphasize the need for further research into the potential oral health risks associated with *jèdijèdí* therapies (Anwar et al., 2025), especially for vulnerable groups such as children. Children's developing bodies, including their oral tissues, are sensitive to the phytochemicals present in certain herbal remedies (Tomassoni and Simone, 2001). For example, some ingredients in *jèdijèdí* formulations, such as naphthalene, may have toxic effects on oral mucosa (Yost et al, 2021). In addition, the acidic nature of some herbal ingredients could interfere with oral pH

balance, increasing the likelihood of dental caries, particularly when children consume these remedies frequently.

The absence of scientific research focused on the oral health implications of *jèdìjèdí* creates a significant gap in our understanding, leaving practitioners and parents alike with insufficient guidance on the safety of these therapies for young populations. The lack of clinical trials and evidence on dosage and side effects contributes to a situation where potentially harmful practices persist without adequate oversight or public education. Given the reliance on traditional health providers and herbalists in many parts of Nigeria, these healers must be included in the conversation about safe healthcare practices.

However, the solution is not simply to dismiss traditional therapies but to integrate them into a more comprehensive and culturally sensitive approach to health education. A robust health promotion strategy should aim to bridge the gap between traditional and modern medical knowledge, empowering both traditional healers and parents to make informed decisions about *jèdìjèdí* therapies and other herbal remedies.

Conclusion

This study highlights the dual impact of *jèdìjèdí*-related cultural practices on pediatric oral health in Nigeria, offering both protective dietary behaviors and potential risks from unregulated herbal remedies. Integrating traditional beliefs with biomedical care through culturally sensitive education, regulatory oversight, and pharmacognostic research offers a pathway to safer, more effective public health strategies that may prove to be beneficial for dental caries prevention for children in Nigeria. Bridging these worlds can enhance oral health equity, preserve cultural heritage, and align local practices with global health goals.

Works Cited

- Akinboro A, Ibrahim A, Muhammed J, Oloyede H, Alimi R. Safety evaluation of an anti-haemorrhoid (pile) herbal recipe (locally called ‘Agbo jedi-jedi’) of Southwestern Nigeria using animal genetic assays. *Toxicol Adv.* 2023;5(1):2. doi: 10.53388/TA202305002.
- Akinsolu FT, Gbaja-Biamila TA, Salako AO, Adewole IE, Olagunju MT, Abodunrin OR, Ola OM, Abel C, Eleje GU, Ezechi OC, Tantawi ME, Lusher J, Foláyan MO. A systematic review and meta-analysis of the association between sugar intake and dental caries in Nigeria. *BMC Oral Health.* 2024;24(1):1532. doi: 10.1186/s12903-024-05309-z.
- Alabi TO, Aliyu TK. Medical doctors do not know it, nor can they treat it: Identifying the common neonatal illnesses and preferred healthcare practices in a Yoruba community, Nigeria. *Int. J. Mod. Anthropol.* 2022; 2(18): 961 – 986 DOI: <http://dx.doi.org/10.4314/ijma.v2i18.3>.
- Anwar MA, Sayed GA, Hal DM, Hafeez MSAE, Shatat AS, Salman A, Eisa NM, Ramadan A, El-Shiekh RA, Hatem S, Aly SH. Herbal remedies for oral and dental health: a comprehensive review of their multifaceted mechanisms including antimicrobial, anti-inflammatory, and antioxidant pathways. *Inflammopharmacology.* 2025;33(3):1085-1160. doi: 10.1007/s10787-024-01631-8.
- Arogundade AO, Igbekoyi KE, Ijabadeniyi OA. Determinants and patterns of treating hemorrhoids (JediJedi) in Ekiti State, Nigeria. *Traditional Medicine and Modern Medicine* 2024; 07: 75-83.
- Azeez A, Isiugo-Abanihe UC. Disease diagnosis and management: the experiences of hemorrhoid herbal vendors and customers in Oyo State, Nigeria. *Journal of Social, Behavioral, and Health Sciences.* 2019; 13(1):82–97. doi:10.5590/jsbhs.2019.13.1.05.
- Azeez A, Isiugo-Abanihe UC. Sociocultural context and determinants of treatments for hemorrhoids among the Nigeria Police Force, Oyo State Command. *Journal of Social, Behavioral, and Health Sciences.* 2017; 11: 31–46. doi:10.5590/JSBHS.2017.11.1.02
- Brieger WR. Jedi jedi, a Yoruba cultural disease with implications for home management of diarrhoea. *Health Education Research.* 1990; 5(3):337-342.
- Brimah P, Adigun A. Jedi-jedi: Towards A Formal Medical Classification of a sugar problem in Africans. *RGUILD* 2014;2(1)10001.
- Daramola OO, Omotoso DR, Oyeyemi WA. Herbal Medicinal Therapy for Haemorrhoid and Sexual Dysfunction - Perception and Practice among Adult males in Ibadan metropolis, Southwest Nigeria. *Best Journal* 2023; 20 (3): 59 - 68. eISSN 2645 – 3142.
- De Marco S, Tiso D. Lifestyle and Risk Factors in Hemorrhoidal Disease. *Front Surg.* 2021;8:729166. doi: 10.3389/fsurg.2021.729166.
- El Tantawi M, Folayan MO, Mehaina M, Vukovic A, Castillo JL, Gaffar BO, Arheiam A, Al-Batayneh OB, Kemoli AM, Schroth RJ, Lee GHM. Prevalence and Data Availability of Early Childhood Caries in 193 United Nations Countries, 2007-2017. *Am J Public Health.* 2018;108(8):1066-1072. doi: 10.2105/AJPH.2018.304466.

- Elidrissi SM, Naidoo S. Prevalence of dental caries and toothbrushing habits among preschool children in Khartoum State, Sudan. *Int Dent J*. 2016; 66:215-20. doi: 10.1111/idj.12223.
- Fasinu, PS, Bouic PJ, Rosenkranz B. An overview of the evidence and mechanisms of herb–drug interactions. *Frontiers in Pharmacology*. 2012; 3:69. P.14
- Folayan MO, Kolawole KA, Oziegbe EO, Oyedele T, Oshomoji OV, Chukwumah NM, et al. Prevalence and early childhood caries risk indicators in preschool children in suburban Nigeria. *BMC oral health*. 2015;15:1-12.
- Folayan MO, Oginni AB, El Tantawi M, Finlayson TL, Adeniyi A. Epidemiological profile of early childhood caries in a sub-urban population in Nigeria. *BMC Oral Health*. 2021;21:1-10.
- Johnson O. *Therapeutics of West Africa* (Thesis). University of Edinburgh. 1889 hdl:1842/24025
- Jugran AK, Rawat S, Devkota HP, Bhatt ID, Rawal RS. Diabetes and plant-derived natural products: From ethnopharmacological approaches to their potential for modern drug discovery and development. *Phytother Res*. 2021;35(1):223–245. doi: 10.1002/ptr.6821.
- Kimmie-Dhansay F, Barrie R, Naidoo S, et al. Prevalence of early childhood caries in South Africa: a systematic review. *BMC Oral Health*. 2022;22(1):1–13. <https://doi.org/10.1186/s12903-021-01982-6>.
- Kiwanuka SN, Astrøm AN, Trovik TA. Dental caries experience and its relationship to social and behavioural factors among 3-5-year-old children in Uganda. *Int J Paediatr Dent*. 2004;14(5):336-46.
- Mwakayoka H, Masalu JR, Namakuka Kikwilu E. Dental Caries and Associated Factors in Children Aged 2-4 Years Old in Mbeya City, Tanzania. *J Dent (Shiraz)*. 2017;18(2):104-111. PMID: 28620634; PMCID: PMC5463768.
- Njoroge NW, Kemoli AM, Gatheche LW. Prevalence and pattern of early childhood caries among 3–5-year-olds in Kiambaa, Kenya. *East Afr Med J*. 2010; 87:134-7. doi: 10.4314/eamj.v87i3.62199.
- Nnawuihe UC, Ehizele AO, Afolabi AO, Nwaokorie FO, Lusher J, Akinsolu FT, Salako AO, Ezechi OC, Foláyan MO. Risk indicators for dental caries among preschoolers, school children/adolescents, and adults in Nigeria: a scoping review. *BMC Oral Health*. 2025; 25(1):281. doi: 10.1186/s12903-025-05668-1.
- Nordhagen S, Pries AM, Dissieka R. Commercial Snack Food and Beverage Consumption Prevalence among Children 6-59 Months in West Africa. *Nutrients*. 2019 Nov 9;11(11):2715. doi: 10.3390/nu11112715.
- Okolo CC, Aborisade AO, Oguchi CO, et al. A systematic review and meta-analysis on the epidemiology of early childhood caries in Nigeria. *Discov Public Health*. 2024; 21: 193. <https://doi.org/10.1186/s12982-024-00324-5>
- Olateju A. Jedi O M’Akowe (Hemorrhoid respects not even the educated elite): A sociolinguistic-stylistic analysis of the language of Yoruba herbal medicine practitioners. In A. Ojo & L. Moshi

- (Eds.), Selected proceedings of the 39th Annual Conference on African Linguistics. Somerville, MA: Cascadilla Proceedings Project. 2009; 156-165.
- Olatosi OO, Oyapero A, Onyejaka NK. Disparities in caries experience and socio-behavioural risk indicators among private school children in Lagos, Nigeria. *Pesquisa Brasileira em Odontopediatria e Clínica Integrada*. 2020; 20: e0023.
- Oreagba IA, Oshikoya KA, Amachree M. Herbal medicine use among urban residents in Lagos, Nigeria. *BMC Complement Altern Med*. 2011; 11: 117. <https://doi.org/10.1186/1472-6882-11-117>.
- Osungunna MO, Oluremi BB, Talabi I. Comparative microbial quality of Jedi drinks sold in two major cities in Nigeria. *Pakistan Journal of Nutrition*. 2010; 9: 769–772.
- Rani J, Dhull SB, Rose PK, Kidwai MK. Drug-induced liver injury and anti-hepatotoxic effect of herbal compounds: a metabolic mechanism perspective. *Phytomedicine*. 2024 Jan;122:155142. doi: 10.1016/j.phymed.2023.155142.
- Soladoye MO, Adetayo MO, Chukwuma EC, Adetunji AN. Ethnobotanical Survey of Plants Used in the Treatment of Haemorrhoids in South-Western Nigeria. *Annals of Biological Research*, 2010; 1 (4): 1-15. <http://scholarsresearchlibrary.com/archive.html>
- Thopil A. Risk factors associated with early childhood caries: an epidemiological survey in Mariental, Namibia. Doctoral dissertation, University of the Western Cape. 2013.
- Tomassoni AJ, Simone K. Herbal medicines for children: an illusion of safety? *Curr Opin Pediatr*. 2001;13(2):162-9. doi: 10.1097/00008480-200104000-00014.
- Wenger E. *Communities of practice: Learning, meaning and identity*. Cambridge, UK: Cambridge University Press. 1998. ISBN 052143017. 8hbk;0521663636pb.
- WHO (World Health Organisation). Ending childhood dental caries: WHO implementation manual. 28 January 2020.
- Yost EE, Galizia A, Kapraun DF, Persad AS, Vulimiri SV, Angrish M, Lee JS, Druwe IL. Health Effects of Naphthalene Exposure: A Systematic Evidence Map and Analysis of Potential Considerations for Dose-Response Evaluation. *Environ Health Perspect*. 2021; 129(7):76002. doi: 10.1289/EHP7381.