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ORIGINAL ARTICLE

TRADITIONAL MEDICINE PRACTITIONERS' PROFILES AND SNAKEBITE MANAGEMENT TECHNIQUES IN IMO AND RIVERS STATES, NIGERIA

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ABSTRACT
*Snakebite envenomation remains a major public health concern in Nigeria, particularly in rural communities where access to conventional healthcare and antivenom are limited. Traditional medicine practitioners (TMPs) play a major role in snakebite management, offering treatment based on indigenous knowledge and ethnobotanical remedies. This study examines the demographic profile of TMPs, and their snakebite management practices in Orsu West Local Government Area (LGA) of Imo State and Emohua LGA of Rivers State, Nigeria. Purposive sampling techniques using a 34% sampling intensity were used to administer 236 structured questionnaires to TMPs in the study area. Results shows that in Orsu West, 60.3% of the TMPs were males, whereas Emohua had a higher proportion of female TMPs (55%). Majority (*26.3%*) of the respondents in both areas were over 60 years old, and most (*72.9%*) were married. Educational levels varied, with a significant number of respondents in Emohua (41.7%) having no formal education, while primary education was most prevalent in Orsu West (42.2%). The most common source of knowledge on snakebite management was inheritance (62.07%) in Orsu West and 56.67% in Emohua). The number of apprentices varied, with 57.76% of TMPs in Orsu West having no apprentices, whereas in Emohua, 40.83% had apprentices under their tutelage. In terms of successful snakebite treatments, the highest category in Orsu West comprised TMPs who had treated over 15 victims, while in Emohua, the majority had treated only 1–5 patients. Additional treatment materials included animal parts, charcoal, black stone, and kerosene. While TMPs have successfully managed many snakebite victims, the safety and efficacy of their methods remain unverified scientifically. Hence, the need for collaboration between TMPs and biomedical practitioners to improve snakebite management and reduce mortality rates in the study areas.*
KEYWORDS: *Snakebites, envenomation, antivenom, Orsu, Emohua*

INTRODUCTION
Snakebite envenomation is a major public health challenge in sub-Saharan Africa. Nigeria, with its diverse ecosystems and rich herpetofauna (Efenakpo *et al*., 2025), is among the countries in Africa with high incidences of approximately 15,000 to 20,000 cases of snakebite-related morbidity and mortality (Habib *et al*., 2013; Efenakpo *et al*., 2023). Traditional communities, where access to conventional medical facilities is limited couple with unaffordable anti-venom therapy, traditional medicine practitioners (TMPs) often play a major role in snakebite management (Efenakpo *et al*., 2023). TMPs have long been recognized for their role in primary healthcare delivery, particularly in remote communities where modern medical services are scarce (Ahmad *et al.*, 2014). The reliance on traditional medicine in Nigeria stem from a deeply rooted cultural beliefs, effectiveness, accessibility, and relatively affordability (Janardhan *et al.*, 2014; Owolabi *et al.*, 2018; Ugboko *et al.*, 2020). Imo and Rivers States,

located in the southeastern and southern regions of Nigeria, respectively, have venomous snake species such as black-necked spitting cobra *(Naja nigricollis*), Gaboon viper *(Bitis gabonica),* African Saw-scaled Viper *Echis ocellatus,* Puff Adder *Bitis arietans* and Rhombic Night Adder (*Causus rhombeatus),* that have been implicated as major culprit in most snakebite envenomation in the country (Habib *et al*., 2013; Ameen *et al.*, 2015; Efenakpo *et al*., 2023). The need for an in-depth understanding of snake local treatment approaches, especially those provided by TMPs in the face of increasing snakebite envenomation, a neglected tropical disease necessitated this study.

TMPs often use multiple therapeutic strategies and traditional healing techniques, including herbal remedies, incantations, ritualistic practices and physical interventions such as tourniquets and incision methods, to manage snakebite victims (Ameen *et al.*, 2015; Ijeomah *et al*., 2017; Asante-Kwatia, *et al*., 2021). Although some of the traditional treatments have shown potential efficacy, the lack of scientific validation, standardization, and regulatory oversight remains a major concern (Efenakpo *et al*., 2023). Also, despite growing global interest and recommendations in integrating traditional and modern medicine, there is limited documentation of the profiles, knowledge base, and treatment methodologies of TMPs in Nigeria, particularly in Imo and Rivers States. Hence, surveying the demographic characteristics, training, experience, and treatment practices of TMPs can provide valuable insights into their potential contributions to snakebite management. Consequently, the study aims to profile TMPs involved in snakebite treatment in Imo and Rivers States, Nigeria, with a focus on their demographic characteristics, training background, and therapeutic approaches.

MATERIALS AND METHODS

Study Area

The study was carried out in two geographically distinct regions: Orsu West Local Government Area (LGA) in Imo State and Emohua LGA in Rivers State, Nigeria (Figure 1). Orsu West LGA, one of the 27 LGAs in Imo State, is predominantly inhabited by the Igbo ethnic group. It is positioned between latitudes 5°10′N and 5°2′N and longitudes 6°32′E and 6°52′E (Efenakpo *et al*., 2023). The local economy is largely agrarian, with small-scale trading providing supplementary income for residents. Conversely, Emohua LGA, located in Rivers State, spans approximately 5,239 km² with a population of 397,000. It is situated at coordinates 04˚53′38.3″N and 06˚54′38″E (Dennis and Goddy, 2019). Agriculture remains the principal occupation, complemented by trading and employment in the public sector (Ugbomeh *et al*., 2018). Both study sites fall within the tropical rainforest belt, experiencing a humid tropical climate marked by alternating wet and dry seasons. The average temperature fluctuates between 22°C and 29°C, while humidity levels remain moderate at approximately 64%.

Sampling Techniques and Methods of Data Collection

Data were gathered using a combination of structured questionnaires, direct field observations, and in-depth interviews. In total, 16 communities, eight from each LGA were randomly selected for the survey. The TMPs were identified through purposive sampling based on their prominence within their communities and a minimum of five years of residency. A sampling intensity of 34% was applied, resulting in the distribution of 116 questionnaires in Orsu West LGA and 120 in Emohua LGA. The questionnaires covered key areas such as the demographic background of TMPs, their experience in managing snake envenomation, methods of remedy preparation and administration, and familiarity with local snake species.

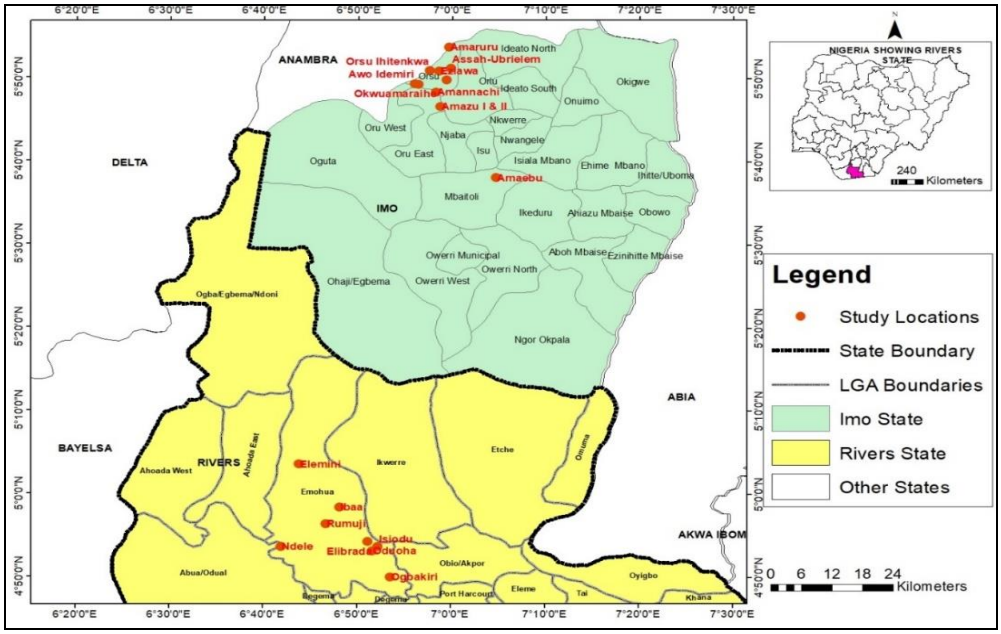

Figure 1. A Map Showing Communities in Emuoha and Orsu; Source: Efenakpo *et al.* (2023)

Method of Data Analysis

Data was analysed using descriptive statistics and results were presented using descriptive statistical tools such as tables and figures.

RESULTS

Demographic Characteristics of TMP in Orsu West and Emohua LGA

Table 1 shows that in Orsu West, males constituted a larger portion (60.3%) of respondents, while females made up 39.7%. In contrast, Emohua had a higher proportion of female respondents (55%) compared to males (45%). Majority of the respondents in both areas were over 60 years old, with 51.7% in Orsu West and 60.8% in Emohua. Most respondents were married, with 67.2% in Orsu West and 78.3% in Emohua. A family size of 4–6 members was most common in both areas (54.3% in Orsu West and 65.8% in Emohua). Families with more than 10 members were least common, comprising only 2.6% in Orsu West and 1.7% in Emohua. Primary education was most prevalent among respondents in Orsu West (42.2%), whereas Emohua had a higher percentage of respondents with no formal education (41.7%). Most respondents had lived in their respective communities for over ten years (90.5% in Orsu West and 66.7% in Emohua). The prevalent income range in both areas was ₦51,000 - ₦100,000, with 37.1% of respondents in Orsu West and 70.8% in Emohua falling into this bracket. The highest income bracket (above ₦200,000) was least, with only 2.6% in Orsu West and 2.5% in Emohua.

Knowledge Sources of Snakebites Management in Orsu West and Emohua LGA

Knowledge source on how snakebites are managed traditionally in the study area is shown in Figure 2. Inheritance had the highest TMPs source of snakebites management knowledge in Orsu West and Emohua LGAs with 72 (62.07%) and 68 (56.67%) respondents respectively.

Table 1: Demographic Characteristics of TMPs in Orsu West, and Emohua LGAs

		Orsu West		Emohua LGA		Entire study area	
Demographics	**Parameters**	**Freq.**	**Per (%)**	**Freq.**	**Per (%)**	**Freq.**	**Per (%)**
Sex	Male	70	60.3	54	45.0	124	52.5
	Female	46	39.7	66	55.0	112	47.5
Age	Below 20	2	1.7	0	0.0	2	0.8
	21-30	5	4.3	1	0.8	6	2.5
	31 – 40	4	3.4	0	0.0	4	1.7
	41 – 50	18	15.5	11	9.2	29	12.3
	51 – 60	27	23.3	35	29.2	62	26.3
	Above 60	60	51.7	73	60.8	133	56.4
Marital Status	Married	78	67.2	94	78.3	172	72.9
	Single	12	10.3	2	1.7	14	5.9
	Separated	7	6.0	1	0.8	8	3.4
	Widow(er)	19	16.4	23	19.2	42	17.8
Religion	Christianity	64	55.2	114	95.0	178	75.4
	Islam	1	0.9	0	0.0	1	0.4
	Traditional	51	44.0	6	5.0	57	24.2
Family Size	1 – 3	20	17.2	18	15.0	38	16.1
	4 – 6	63	54.3	79	65.8	142	60.2
	7 – 9	30	25.9	21	17.5	51	21.6
	Above 10	3	2.6	2	1.7	5	2.1
Educational Qual.	No Formal Education	15	12.9	50	41.7	65	27.5
	Primary	49	42.2	38	31.7	87	36.9
	Secondary	27	23.3	29	24.2	56	23.7
	Tertiary	25	21.6	3	2.5	28	11.9
Level of Income	Below 50, 000	41	35.3	6	5.0	47	19.9
	51,000 –100,000	43	37.1	85	70.8	128	54.2
	101,000–150,000	16	13.8	26	21.7	42	17.8
	151,000–200,000	13	11.2	3	2.5	16	6.8
	Above 200, 000	3	2.6	0	0.0	3	1.3
Residency	0 – 5	4	3.4	2	1.7	6	2.5
	6 – 10	7	6.0	38	31.7	45	19.1
	Above 10	105	90.5	80	66.7	185	78.4

NB: Level of Income is in Naira (₦)

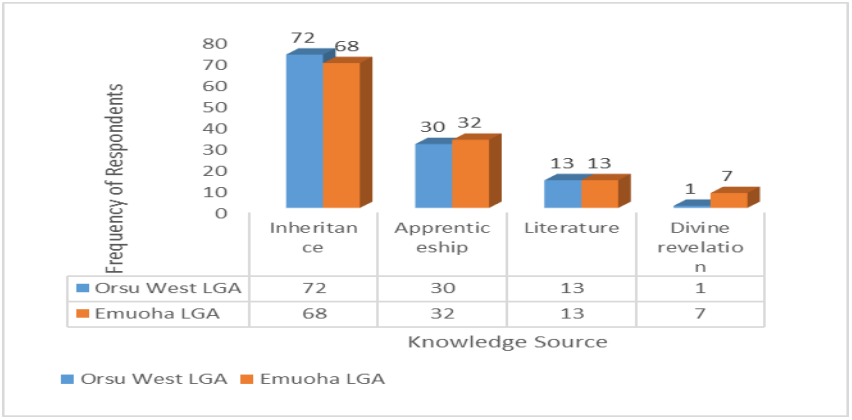

Figure 2: Sources of knowledge on Snakebite Management in Orsu West and Emohua LGA

Number of Apprentices owned by TMPs in Orsu West and Emohua LGA

Figure 3 shows the number of apprentices under the TMPs interviewed. The result shows that most TMPs (67, 57.76%) in Orsu West had no apprentices while in Emohua LGA majority (49, 40.83%) of the respondents had apprentices under their tutelage.

Number of Snakebite Patients Successfully Treated by TMPs in Orsu West and Emohua LGA

The number of patients successfully treated by TMPs in Orsu West and Emohua LGA is presented in Figure 4. The result shows TMPs who have successfully treated 15 patients and above categories had the highest occurrence in Orsu West while the least categories were TMPs who had successfully treated 10-15 snakebite patients. On the other hand, the majority of the number of patients successfully treated by TMPs in Emohua LGA were 1- 5 patient categories and the least were in 10 - 15 snakebite patients.

Other Materials Used by TMPs in Treating Snakebite in Orsu West and Emohua LGA

Materials other than plants used by TMPs in managing snakebites include animals/insect parts, black stone, charcoal and kerosene as shown in Figure 5.

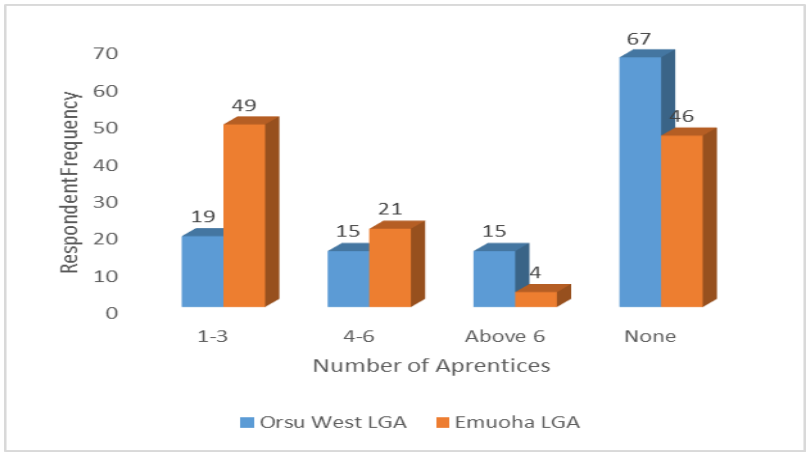

Figure 3: Number of Apprentices in Orsu West LGA and Emohua LGA

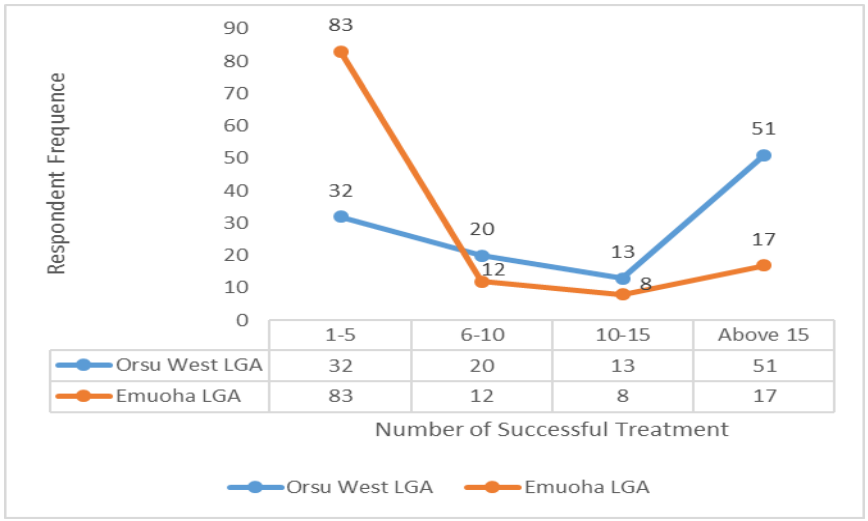

Figure 4: TMPs Number of Snakebite Patients Successfully Treated in Orsu West and Emohua

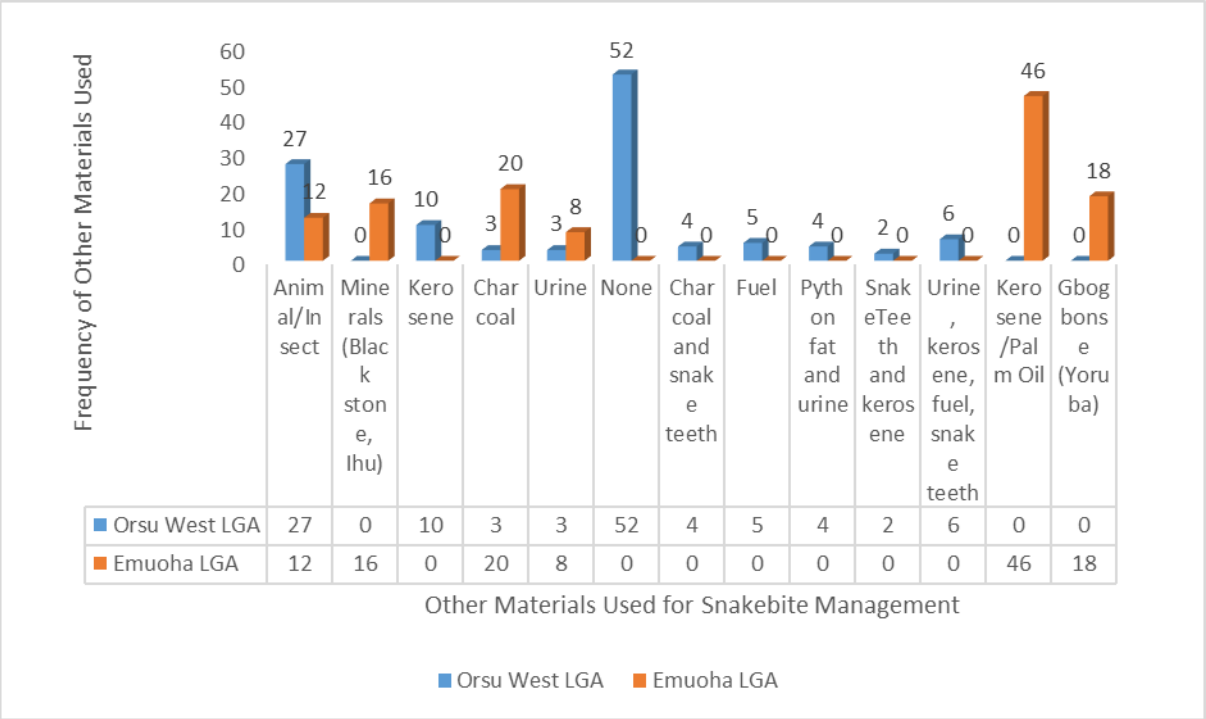

Figure 5: Materials other than plants used by TMPs to manage snakebite in the study area

Sources of Plant Materials used to Manage Snakebites by TMPs in the study areas

In Orsu West, plant materials used are mostly cultivated by TMPs, while those who collected plant materials from the wild form the least category of plant source (Figure 6). In contrast, in Emohua LGA, plant materials used for managing snakebites by TMPs are mostly sourced from the wild (43, 35.8%), while 26 TMPs representing 21.67% sourced plants materials from both wild and cultivated sources.

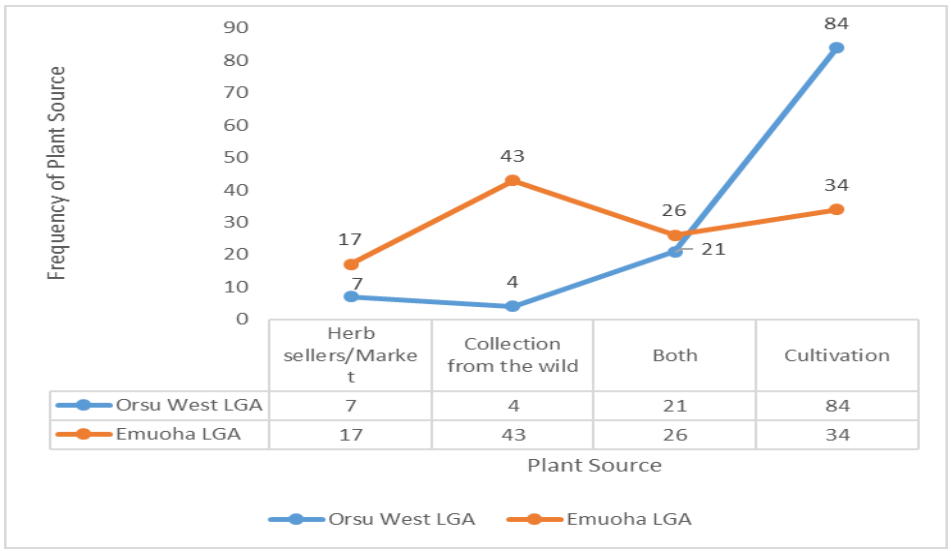

Figure 6: Material Source by TMPs in Orsu West and Emohua LGA

Age of People Mostly Bitten By Snakes in The Study Areas

The result of the age of people mostly bitten by snakes in the study areas is presented in Figure 7. In Orsu West, TMPs perceived the age category above 50 years as people mostly bitten by snakes, while those below 20 years had the lowest incidence of snake bites. On the other hand, in Emohua LGA, TMPs perceived the age category of 45-50 years as people mostly bitten by snakes, while those 21-29 years had the lowest incidence of snake bites.

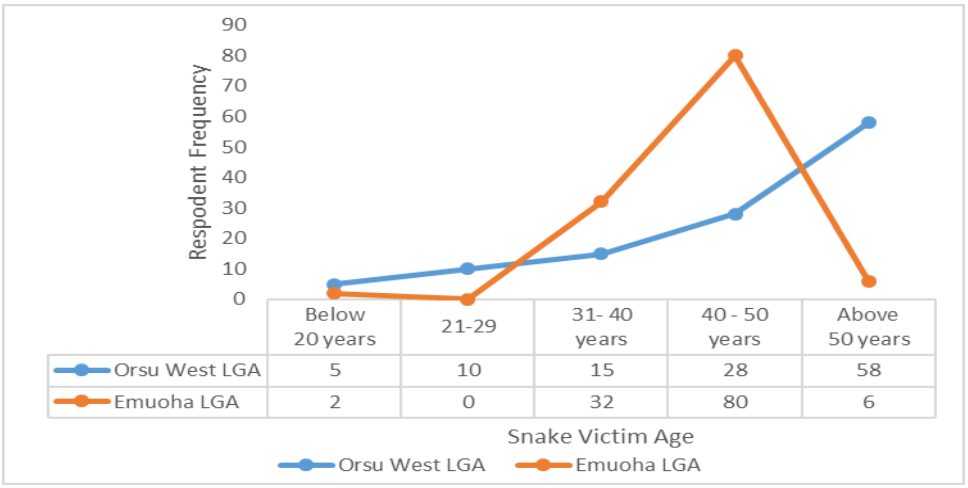

Figure 7: Age of people mostly bitten by Snakes in Orsu West and Emohua LGA

DISCUSSION

Respondents' Demographic Characteristics of TMPs in Orsu West and Emohua LGA

In Orsu West, the gender disparity may suggest that males are more actively involved in administering or prescribing snakebite remedies, which may also be tied to agricultural or community defence activities where men are engaged more. Conversely, in Emohua, the larger number of female respondents may suggest that women play a significant role in household-based healthcare, including the use of local herbal remedies. Orsu West result aligns with Adebo and Alfred (2011), who reported that male practitioners dominated the field of herbal medicine in Nigeria. Togola *et al.* (2005) also found out that men largely dominate traditional medical practice in Mali and women had less involvement and understanding of traditional medicine.

The dominance of older respondents in both regions may indicates a significant reliance on elderly practitioners for indigenous knowledge, especially in rural communities. This result is consistent with findings of Togola *et al.* (2005) and Diame (2010), who noted that most traditional healers were over 40 years old. The older age group have greater tendencies to possess deep, traditional knowledge passed down through generations. However, the prevalence of older TMPs suggests a potential risk of knowledge gaps and loss. A higher proportion of married respondents, particularly in Emohua, suggest the socio-cultural importance of marriage within the context of traditional healthcare. Marriage may correlate with having a larger support system for healthcare knowledge and treatment practices, which are often shared and maintained within family structures. The common family size of four to six in both LGAs further supports the idea that traditional medicine is a family-cantered practice, potentially passed down from one generation to another.

Educational background among TMPs plays a critical role in shaping the application and acceptance of indigenous knowledge consequently impacting the types and procedure of treatments. In Orsu West, most TMPs had primary education, whereas Emohua had a higher percentage of respondents with no formal education. The difference in educational attainment between the two regions suggests local differences in access to formal education or the socio-economic context of each area. The reliance on primary education may impact the methods negatively, limits training potentials and scope of traditional practices. In Emohua, there may be a greater reliance on indigenous knowledge, as TMPs may have fewer opportunities to engage with formal healthcare systems. Majority of the respondents from both regions had lived in their communities for over ten years, suggesting a strong connection by TMPs to their local environment and traditions, which is vital for the preservation and application of indigenous knowledge.

Knowledge Sources for Snakebite Management in Orsu West and Emohua LGA

The prominence of inheritance as a source of knowledge in the study shows the deep-rooted nature of traditional medical practices in these areas. Snakebite management, being a critical aspect of rural healthcare, is likely embedded in the daily lives and customs of the communities. The result suggests that TMPs learnt the practice from their elders, gaining a profound understanding of the indigenous remedies, which are typically based on local plants, rituals, and practices passed down through generations. This generational transmission helps maintain the continuity of the practice, ensuring that the knowledge is not lost, despite the challenges posed by modern medical advancements, while also showing the central role that familial and community networks ties play in maintaining traditional healthcare systems. This cultural transfer also ensures that the knowledge remains highly localized, specific to the snake species and environmental conditions in the area, making it highly effective within the local context.

Number of Apprentices Owned by TMPs in Orsu West and Emohua LGA

In Orsu West, majority of TMPs reported not having any apprentices as this may suggests a gap in the intergenerational transfer of traditional medical knowledge within this region. The absence of apprentices may be indicative of various factors such as declining interest in traditional medicine, economic factors and cultural shifts. Without apprentices, there is a critical challenge and risk that essential knowledge and continuity of herbal treatments and traditional snakebite management practices may be lost when older TMPs pass away. This aligns with Okwor *et al.* (2014) study that noted low information accessibility, knowledge acquisition, management, and transfer system among traditional herbal medical practitioners are the major constraints in herbal medical profession. In contrast, Emohua LGA revealed a different trend, with majority of TMPs having had apprentices under their tutelage indicating a more robust system of knowledge transfer and mentorship.

Number of Snakebite Patients Successfully Treated by TMPs in the Study Area

In Orsu West, TMPs who have successfully treated over fifteen snakebite patients constitute the highest category. This suggests that a significant number of TMPs in this region are managing a larger caseload of snakebite patients, indicating that traditional medicine is a well-established and widely relied-upon system for treating snakebites in the area and the TMPs have developed a solid reputation for successfully treating such cases. The higher number of snakebite patients treated also points to the reliance of the local population on the TMPs, which may be due to limited access to modern healthcare facilities or a cultural preference for traditional remedies.

In contrast, Emohua LGA presents a different trend, with most TMPs having treated between one and five snakebite patients. This suggests that, on average, the TMPs in Emohua are treating fewer snakebite cases compared to their counterparts in Orsu West and this result may suggest that the TMPs in Emohua specialize in a broader range of medical conditions, and snakebites are not their primary focus. In both regions, the least common category for the number of snakebite patients treated falls within the 10-15 patient range, though the trends are more pronounced in Emohua. This could indicate that snakebite cases are either sporadic or more localized, so the number of TMPs who consistently manage a moderate number of cases is low. In Emohua, this may also reflect an underutilization of TMPs for snakebite treatment, due to either medical pluralism or a preference for medical professionals in hospitals and clinics.

Other Materials Used by TMPs in Treating Snakebite in Orsu West and Emohua LGA

While plant materials remain the cornerstone of treatment, additional substances—ranging from animal parts to household items—were also utilized, albeit in varying frequencies across the two regions. In Orsu West, most TMPs rely exclusively on plants to treat snakebites, with few incorporating other materials.

This indicates a strong dependence on herbal knowledge and traditional remedies, highlighting the foundational role of plant-based treatments in the local healing practices for snakebites. However, the TMPs who use additional materials in managing snakebites, the use of animal or insect parts in treating snakebites may suggest a belief in the power of these materials to either neutralize venom or assist in the healing process. This practice may be rooted in symbolic or experiential knowledge, where certain animal parts are believed to transfer specific healing energies or characteristics to the person bitten.

On the other hand, the least substances reported by TMPs in Orsu West were snake parts and kerosene, and the use of snake parts may be symbolic or ritualistic approach, in which the materials from the same species are believed to have a curative effect. The inclusion of kerosene, often associated with unconventional treatments, may reflect the blending of traditional practices with some elements of contemporary remedies. In contrast, Emohua shows a broader and more diverse range of materials used in snakebite treatment. The use of charcoal and kerosene/palm oil in Emohua LGA is indicative of a more eclectic approach to snakebite management. Charcoal, often used for its purported absorbent properties, may be believed to help draw out the venom or toxins from the bite site. Kerosene and palm oil are likely used for their antiseptic, soothing, or warming qualities, which may help alleviate pain or inflammation. The combination of these materials with plant remedies suggests a more integrative approach, where TMPs may incorporate both traditional herbal treatments and materials that are more familiar in cross-cultural medicinal contexts. This result aligns with Chuat *et al.* (2021) who reported the application of the black stone in addition to other treatment materials to draw out the venom from snakebite victims and the findings of Ijeomah *et al.* (2017) on the immediate consumption of ground charcoal and water by snakebite victims.

Sources of Plant Materials Used by TMPs in Orsu West and Emohua LGA

In Orsu West, most TMPs source their plant materials primarily from cultivation, suggesting that the region has a more controlled, possibly agriculturally focused approach to obtaining plants for medicinal use. Also, it implies that the TMPs in Orsu West had a broader knowledge of these plants, their cultivation requirements and sustainability, leading to more effective and targeted use of these materials for snakebite management. On the other hand, the least source of plant materials in Orsu West is wild collection. This may indicate that wild plant resources are either difficult to access or not as prevalent in the area.

In contrast, Emohua TMPs sourcing their plant materials for snakebite treatments from the wild mostly reflects the region's reliance on the natural environment for healthcare. Also, in Emohua, sourcing plants from the wild, might be more practical or cost-effective than cultivating them. The result in Emohua align with Kisangau *et al.* (2007) study in Tanzania which had only a few herbal practitioners involved in medicinal plant cultivation with majority of the TMPs sourcing plant materials from the wild. Also, Edwards (2004), noted that over 2/3 of the 50,000 medicinal plants used globally are collected from the wild, and approximately 1/5 of them are currently endangered.

Age of People Mostly Bitten by Snakes in Orsu West and Emohua LGA

In Orsu West, the higher incidence of snakebites among individuals above fifty years may be connected to the fact that older adults in rural areas are often involved in farming activities, and they are at greater risk of encountering snakes. Conversely, the lower incidence of snakebites among people below twenty years in Orsu West may be due to fewer young individuals engaging in agricultural work. In Emohua, TMPs perceived people between 45-50 years as the group most bitten by snakes, while individuals aged 21-29 years had the lowest incidence of snakebites. This pattern differs by age specificity from the one observed in Orsu West but similar in age group as older people are more vulnerable.

Similar to Orsu West, individuals in the 45–50-year age range in Emohua may be more likely to engage in agricultural work, making them more vulnerable to snakebites. The lower incidence of snakebites among individuals aged 21-29 years in Emohua may reflect changing social and economic patterns. Younger individuals in this age group are less likely to engage in agricultural work. As a result, they may have less exposure to snakebite risks compared to older generations who spend more time in rural environments.

CONCLUSION

The study shows the critical role of TMPs in snakebite management in rural communities of Orsu West and Emohua LGAs. Their indigenous knowledge and treatment methods have contributed to the survival of numerous snakebite victims, particularly in areas with limited access to modern medical facilities. However, the absence of standardized treatment protocols and scientific validation of traditional remedies raises concerns regarding the efficacy and safety of these treatments. The demographic distribution of TMPs varies between the two LGAs, with differences in gender, education, and economic status influencing their practices. The variation in the number of successfully treated patients suggests differing levels of expertise and access to effective remedies. The predominant reliance on inherited knowledge and the limited presence of younger apprentices indicates potential gaps in the continuity of traditional medical knowledge. Additionally, the use of non-plant materials in treatment raises questions about safety and effectiveness. Therefore, there is the need for a more structured approach to snakebite management, including scientific validation of traditional remedies, training programmes for TMPs, and policy integration that facilitates collaboration between traditional and conventional healthcare systems in the study areas.

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