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Predictors of use of Animal-based Traditional Medicines as First Choice Medication when Unwell Amid Abundant Herbal and Orthodox Medicines – A Study in Ghana

Evans Paul Kwame Ameade[1*], Daniel Korley Attuquayefio[2], Francis Gbogbo[2], Joseph Adusei-Sarkodie[3], Benjamin Yeboah Ofori[2], Stephen Gbedema[4], Esther Bayo[5] and Emmanuel Adom[1]

[1]*Department of Pharmacognosy and Herbal Medicine, School of Pharmacy and Pharmaceutical Sciences, University for Development Studies, Tamale*

[2]*Department of Animal Biology and Conservation Sciences, University of Ghana, Legon - Accra*

[3]*Department of Pharmacognosy and Herbal Medicine, School of Pharmacy, University of Ghana, Legon – Accra*

[4]*Department of Pharmaceutics, Faculty of Pharmacy and Pharmaceutical Sciences, Kwame Nkrumah University of Science and Technology, Kumasi*

[5]*ART Unit, Tain District Hospital, Nsawkaw*

[*]Corresponding author: Evans Paul Kwame Ameade, Department of Pharmacognosy and Herbal Medicine, School of Pharmacy and Pharmaceutical Sciences, University for Development Studies, Tamale.

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Abstract

Besides conventional medicines, traditional medicines are used globally for the management of ailments. Even in places where orthodox or herbal medicines are accessible and available, some persons patronise animal-based traditional medicines (ABM). This study assessed reasons and factors why a person will opt for ABM as their first choice when unwell. Data obtained from 264 buyers of raw animal parts meant for traditional medicine across 39 markets in Ghana was analysed using the Statistical Programme for the Social Sciences, Version 26. Results were presented in tables and charts while a multivariate logistic regression model was used to assess predictors. Using a confidence interval of 95%, an association between variables was assumed to be significant when $p \leq 0.05$. Most buyers of ABM opted for orthodox medicines (41.7%) with only 12.3% choosing ABM when unwell. Up to 48.1% of these patrons use ABM for medical conditions while 47.0% apply them for spiritual or mystical purposes. Personal preference (21.4%), followed by affordability (17.9%) and fast-acting effect (17.9%) were the topmost reasons why patrons opted for ABM. Patrons with post-basic education were 29.8% less likely (cOR = 0.298; 95% CI = 0.09 -0.982; p-value = 0.047) while Traditional African Religion (TAR) believers were 2.6 times (cOR = 2.607; 95% CI = 1.011 – 6.722; p-value = 0.047) and married patrons, 3.5 times more likely to opt for ABM (17.5% vs 5.7%; cOR = 3.531; 95% CI = 1.019 – 12.321; p-value = 0.047). Religion was found as the only significant predictor (aOR=0.238; 95% CI = 0.075 – 0.757; p-value = 0.015). Attribution of spirituality to animals may account for their importance to TAR believers. ABM are therefore complementary or alternative medicines in Ghana.

Keywords: Animals, Traditional, Medicine, Orthodox, Herbal.

Introduction

The form of medicine practiced by people is dependent on their culture although globalization has led to the importation of exotic forms of medicine across the world. There are generally two forms of medicine; conventional/orthodox/modern/western and traditional and complementary medicine (T&CM) or (traditional and) Complementary and Alternative medicine (TCAM/CAM) referred to as whole medical systems [1]. According to Chan and Cheung (2000), conventional or orthodox medicine is a practice of administering chemically pure substances into the body which produce pharmacological effects leading to subsequent alleviation of the disease or assisting in the diagnosis or prevention of the disorder [2]. Complementary and alternative medicine (CAM) on the other hand refers to all other procedures or approaches to restoration, improvement, and maintenance of human health which are not part of conventional orthodox or Western medicine [3]. It is worth noting that some of these non-conventional methods of providing healthcare are influenced by the traditions and cultures of the areas of practice and are referred to as Traditional Medicines. The WHO, (2013) therefore defined

traditional medicine as "the total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness" [4]. Since prehistoric times, natural products including plants, animals, microorganisms, and marine organisms, have been used by humans as medicines in alleviating or treating diseases [5]. Of all of these materials, the plants were the most commonly used in a practice referred to as herbalism or herbal medicine which is considered the oldest form of Traditional medicine [6]. According to the World Health Organization, (2002), up to 80 per cent of persons living in Africa, use traditional medicines, especially herbal medicine for their primary healthcare needs [7]. Herbal medicines, which have other synonyms such as botanical medicines, vegetable medicines, or phytomedicines, according to Ozioma and Chinwe, (2019) are defined by the World Health Organization (WHO) as medicines made up of herbs, herbal materials, herbal preparations, and finished herbal products that contain whole plants, parts of plants, or other plant materials, including leaves, bark, berries, flowers, and roots, and/or their extracts as active ingredients intended for human therapeutic use or other benefits in humans and sometimes animals [6]. The use of herbal products is on the ascendency even in developed countries to the extent that in the United States of America, approximately 20% of the population is known to use herbal products [8]. For people in developing countries, high dependence on herbal medicines may be due to the ease of accessibility, affordability, availability, and acceptability [4]. In developed countries, however, the drive for the use of herbal medicines may stem from the notion that as plants, herbs are natural and hence safer than orthodox medicines [9, 10]. Even in developing countries whose conventional medical health facilities are sometimes inadequate and under resources, greater proportions will prefer orthodox medicine as the first choice when sick for reasons such as being more effective, better studied and approved, and clarity on the dosages required [11]. However, for centuries and even presently, people of various cultures have used animals and their products such as their waste materials or extracts from their bodies referred to as animal-based medicine (ABM) for healing purposes some of which involve performances of magical or mystical rituals [12]. Several studies worldwide have shown high-level usage of animal parts for the management of various ailments [13-15]. With the abundant presence of herbal medicines and the increasing availability of orthodox medicine across the world, there should be reasons why some people still opt for animal-based medicines. This study which is possibly the first involving patrons of traditional medicine, therefore, investigated the reasons for the use of animal-based medicine and the predictors of factors that would make some persons opt for animal parts and their products as their first-choice medication when unwell.

Method

Study Population

Respondents in this cross-section study were persons (patrons) who had visited traditional medicine vendors in thirty-nine (39) markets across the Republic of Ghana to purchase animal parts for their personal use or were sent by others to procure them on their behalf.

Study Site

The Republic of Ghana is located in the western part of Africa and covers a land size of 238,540 km2 and as of 2021 has a population of 30,792,688 [16]. Ghana, (Figure 1) geographically lies between latitudes 4°45'N and 11°N, and longitudes 1°15'E and 3°15'W and shares her eastern border with the Republic of Togo, western border with La Cote D'Ivoire and in the northern part by Burkina Faso while to the south lies the Gulf of Guinea which is part of the Atlantic Ocean [17].

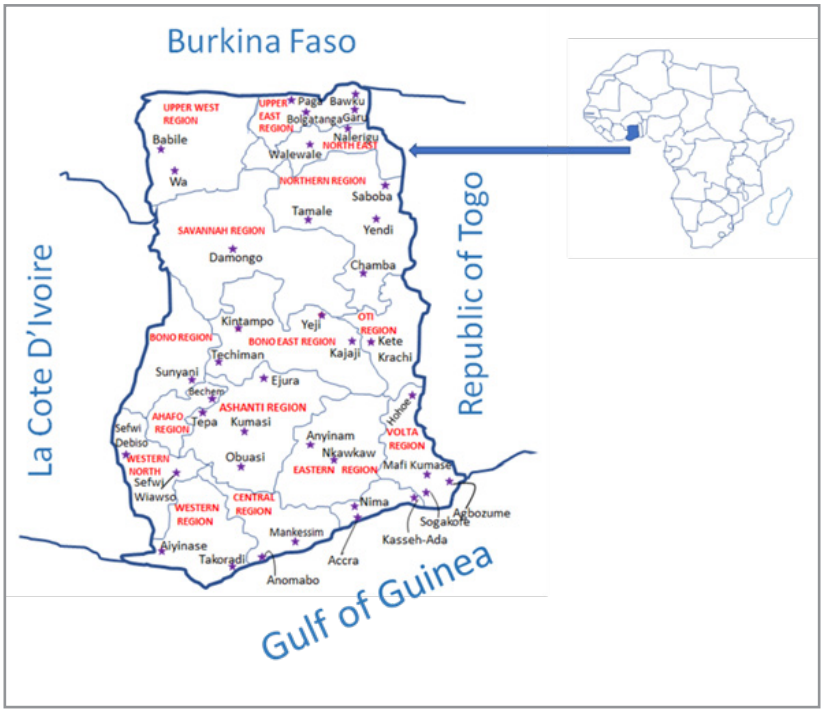

Figure 1: Map of Ghana showing the cities and towns where the patrons of animal-based traditional medicine were surveyed

Research Tools

A de novo pretested and validated semi-structured questionnaire was used to collect the data. Audio/video recording devices were used to record the voices of the informant and some interpreters for repeated playback and subsequent transcribing.

Sample Size

A search by authors did not find records of previous studies involving patrons of animal parts for traditional medicine nor was there any data of patrons of animal-based medicine in Ghana. Authors, therefore, chose to recruit at least six individuals who had visited the stall of a vendor to procure or enquire about an animal part or product for traditional medicine. In a total of 39 markets across all the administrative regions of Ghana having vendors of animal-based medicines, respondents who were buyers of animal parts or products for traditional medicine were invited to partake in the study. A total of two-hundred and sixty-four (264) patrons of animal-based medicines completed the questionnaire.

Sampling Techniques

The convenience sampling technique was applied since many patrons were reluctant to disclose the purposes for which they had come to buy these animal parts, especially if the intended use was for mystical or spiritual purposes.

Data Analysis

Data was initially entered into Microsoft Excel, cleaned, and analysed using the statistical software SPSS (Statistical Package for the Social Sciences) version 26, and Microsoft Excel, Version 2208. Results were presented in tables or graphs. The multivariate logistic regression model was used to determine the association between sociodemographic characteristics of patrons (independent variables) and opting for animal-based medicine as the first choice or not (dependent variable).

Ethical Consideration

Ethical clearance with certificate number ECBAS 011/20-21 was provided by the Ethics Committee for Basic and Applied Science of the University of Ghana. During the collection of data, the participants were informed that accepting to be a participant was indicative of consent. The approved consent form was not used because vendors were apprehensive about signing documents because they were not sure if the researchers were investigating their activities. The research protocol complies with the guidelines of the Declaration of Helsinki and Tokyo for research with humans.

Results

Sociodemographic Characteristics of Patrons or Buyers

Majority of patrons of animal parts in the Ghanaian markets were males (172; 65.2%) and were married (177; 79.8%). Most persons who buy animal-based medicines either for themselves or others were between the ages of 31 and 40 years (65; 32.7%), had no formal education (80; 30.8%) and were adherents of the Islamic religion (100; 38.5%) (Table 1).

Table 1: Sociodemographic Characteristics of Patrons of ABM in Ghanaian Markets

Variable	Subgroup	Frequency	Percentage
Sex	Female	92	34.8
	Male	172	65.2
Ages (years) n = 260	Below 31	63	24.2
	31-40	85	32.7
	41-50	60	23.1
	Above 50	52	20.0
Highest educational level (n = 260)	None	80	30.8
	Primary	45	17.3
	JHS	51	19.6
	SHS	50	19.2
	Tertiary	34	13.1
Religious affiliation (n = 260)	Others	4	1.5
	Christianity	89	34.2
	Islam	100	38.5
	Traditional African Religion	67	25.8
Marital status (n = 250)	Single	57	22.8
	Married	177	70.8
	Divorced/Widowed	16	6.4

Occupations of Patrons

Persons in the informal working sector were in the majority and included farmers (80; 32.1%), traders (72; 28.9%), artisans (16; 6.4%), and fishers (6; 2.4%). Patrons who are employed in the formal sector include teachers (11; 4.4%), public servants (7; 2.8%), and nurses (2; 0.8%). Students (12; 4.8%) were also found patronizing animal parts (Table 2).

Table 2: Occupations of the Patrons of ABM in Ghanaian Markets

Occupation	Frequency	Percentage
Farmers	80	32.1
Traders	72	28.9
Artisans	16	6.4
Students	12	4.8
Teachers	11	4.4
Public servant	7	2.8
Traditional healers	7	2.8
Unemployed	7	2.8
Business executives	6	2.4
Fishers	6	2.4
Drivers	5	2
Housewives	4	1.6
Miners	3	1.2
Hunters	3	1.2
Security guards	3	1.2
Landlord	2	0.8
Nurses	2	0.8
Pastors	2	0.8
Scrap dealer	1	0.4

Patrons' First Choice of Medicine when unwell

The types of medicine the patrons of animal-based medicines will choose when unwell are shown in Figure 2. Most of the patrons of animal parts in this study will first opt for orthodox medicines (105; 41.7%) when unwell. Others chose herbal medicine first (80; 31.7%) while animal-based medicines (31; 12.3%) came out as the least of the options. A total of 36 (14.3%) were uncertain about what their foremost choice of medication would be whenever they were unwell.

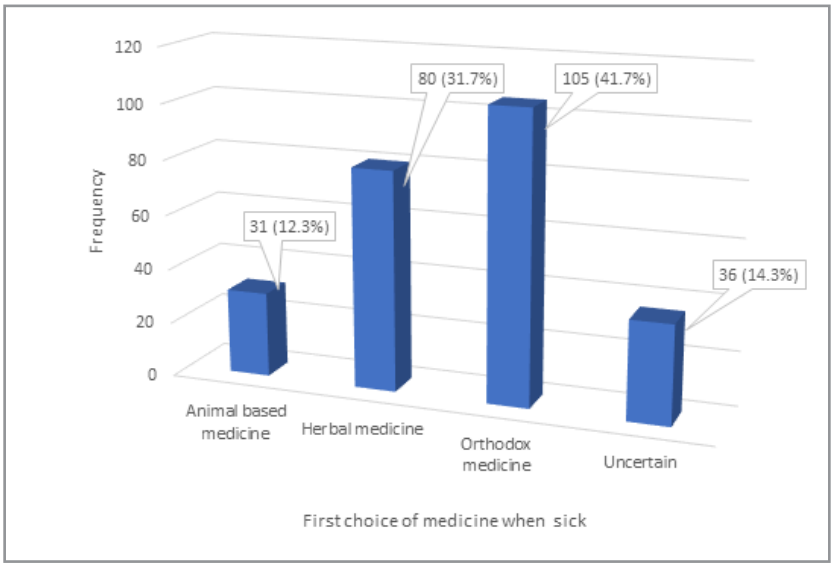

Figure 2: Patrons of ABM's first choice of medicine when unwell

Factors Influencing the Choice of Animal-Based Medicines as the First Treatment Option

Several factors influence the preference of patrons for animal-based medicines (Table 3). Personal preference was the topmost factor (12; 21.4%), followed by affordability (10; 17.9%) and fast action (10; 17.9%). Other notable factors include accessibility (7; 12.5%) and effectiveness of ABM when compared to other forms of medicine (6; 10.7%).

Table 3: Factors Responsible for Patrons' Choice of Animal-Based Medicine as Their First Healing Option When Unwell

Variable	Frequency	Percentage
Personal preference	12	21.4
Affordability	10	17.9
Fast action	10	17.9
Accessibility of animal parts	7	12.5
Better effectiveness compared to other Traditional medicines	6	10.7
Effectiveness for solving both physical and spiritual problems	3	5.4
Ease of use	2	3.6
Assured privacy	2	3.6
Constant availability	2	3.6
Lack of queues at healing centres	1	1.8
Exclusive treatment of some diseases	1	1.8

Types of Conditions or Situations that Require the use of Animal Parts by Patrons

Most of the respondents (127; 48.1%) who purchased animal parts intended to use them only for treating diseases, while 124 (47.8%) bought them for spiritual or ritual purposes. Whereas nine (3.4%) respondents bought these animal parts for non-medicinal or non-spiritual uses, four (1.5%) intended to use these items for both treating diseases and spiritually-related issues (Figure 3).

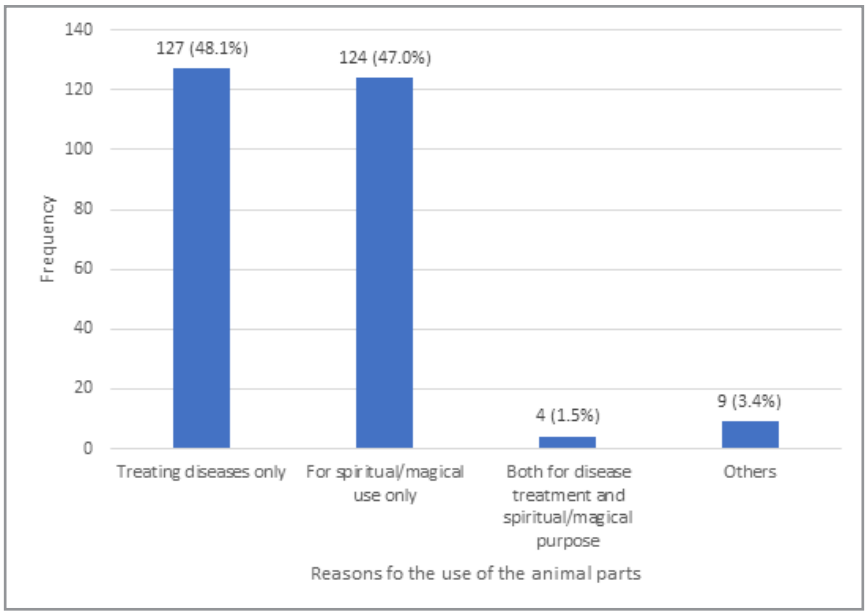

Figure 3: Types of conditions or situations requiring the use of animal parts by patrons

Patrons' History of Purchasing Animal Parts and persons who Recommended the ABM for them

Majority of patrons (210; 79.5%) had a previous history of buying animal-based medicine from the vendors. Whereas 105 (39.9%) were purchasing for others, a greater number (154; 60.1%) bought them for self-use. Most of the non-self-users were other relatives (18; 18.8%) like uncles, aunts, grandparents, nieces, etc. Close relations such as own child (10; 10.4%), father (10; 10.4%), mother (six; 6.3%) and siblings (14; 14.6%) were also among those for whom the animal parts were procured. Majority of patrons buy the animal parts only when needed (151; 71.9%). For most patrons (101; 49.3%), they had visited the market between once and five times to purchase ABM within the previous 6 months. Recommendation for the use or procurement of the ABM was mostly by traditional healers (148; 56.9%), followed by relatives (50; 19.2%) and friends (35; 13.5%) (Table 4).

Table 4: Patron's history of Purchasing Animal parts and Persons who Recommended ABM

Variable	Subgroup	Frequency	Percentage
Is this the first-time purchasing animal parts? (n = 264)	Yes	54	20.5
	No	210	79.5
Was the purchase for self-use?	No	105	39.9
	Yes	158	60.1
If not for self-use, what is your relationship with the user? (n = 96)	Own child	10	10.4
	Church member	2	2.1
	Client	7	7.3
	Father	10	10.4
	Friends	15	15.6
	Guardian	2	2.1
	Traditional healer	1	1.0
	Mother	6	6.3
	Neighbour	3	3.1
	Other relatives	18	18.8
	Sibling	14	14.6
	Spouse	5	5.2
	In-laws	3	3.1
How often do you or your sender buy animal parts? (n = 210)	Every day	12	5.71
	Once a week	10	4.8
	Once a month	22	10.5
	Occasionally only when needed	151	71.9
	I don't know	15	7.14
Number of purchases of animal parts in the past 6 months (n = 205)	1 to 5	101	49.3
	6 to 10	34	16.6
	More than 10 times	41	20.0
	None	29	14.1
Who first recommended animal-based medicine to you or the person who sent you?	Friend	35	13.5
	Magician	2	0.8
	Myself	21	8.1
	Pastor	4	1.5
	Relative	50	19.2
	Traditional healer	148	56.9

Factors Influencing the Purchase of Animal Parts by Patrons

The top 10 factors that influenced the patronage of animal parts by the patrons were: (i) very effective for many conditions (67; 18.9%), (ii) fast-acting effect (47; 13.2%), (iii) affordability (43; 12.1%), (iv) accessibility (30; 8.5%), (v) ability to solve spiritual problems (28; 7.9%), (vi) lack of or minimal side-effects (23; 6.5%), (vii) complete treatment of conditions (20; 5.6%), (viii) effectiveness for treatment of some specific conditions (15; 4.2%), (ix) endorsement by previous users (15; 2.8%) and (x) ease of use (14; 3.9%) (Table 5)

Table 5: Factors Influencing the Purchase of Animal Parts by Patrons

Variable	Frequency	Percentage
Very effective for many conditions	67	18.9
Fast acting effect	47	13.2
Affordability	43	12.1
Accessibility	30	8.5
Solves spiritual problems	28	7.9
No or minimal side effects	23	6.5

Treats conditions completely	20	5.6
Exclusive treatment of some diseases	15	4.2
Endorsement from previous users	15	4.2
Ease of use	14	3.9
Used in conditions that orthodox medicine cannot manage	11	3.1
Greater faith in the animal parts	9	2.5
Effectiveness for solving both physical and spiritual problems	9	2.5
From natural sources	5	1.4
Better effectiveness compared to other Traditional medicines	4	1.1
Best at providing spiritual protection	4	1.1
Assured privacy	4	1.1
Desire to test or confirm its effectiveness	3	0.8
Lack of queues at healing centres	2	0.6
Traditional heritage	2	0.6

Levels of Satisfaction of Patrons After the use of Animal Parts in Traditional Medicine

The levels of satisfaction of patrons after their experience with the use of animal-based medicines are shown in Figure 4. Whereas 17 (7.7%) were unsure of their satisfaction level, as much as 102 (46.2%) strongly agreed that the animal parts purchased and used produced the expected effects while 99 (44.8%) agreed with that assertion. Again, while 2 (0.9%) of the patrons strongly disagreed with the effectiveness of the animal parts, 1 (0.5%) disagreed.

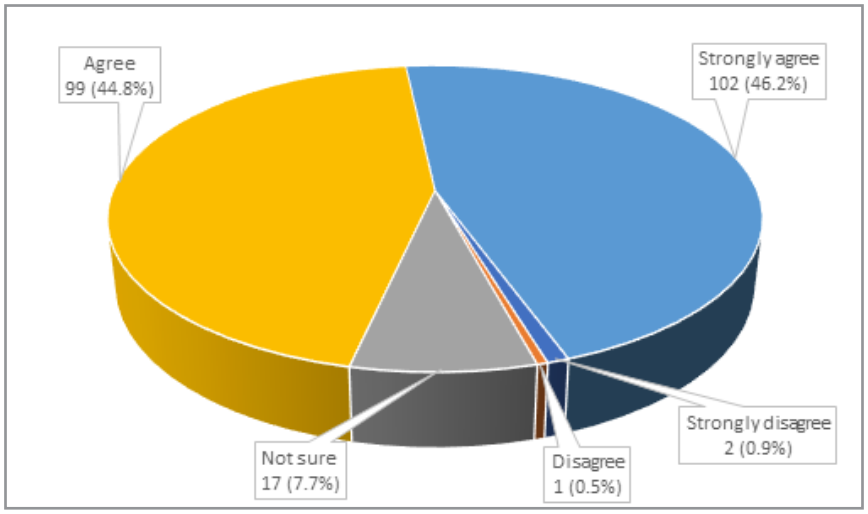

Figure 4: Levels of satisfaction of patrons after the use of animal parts in traditional medicine

Predictor Factors that Make Patrons opt for Animal-Based Medicine as the First Choice of Treatment when Unwell

Table 6 shows the test of association between sociodemographic characteristics (independent variables) and opting for ABM as the first choice of treatment when unwell (dependent variable.) A greater proportion of females than males (15.4% vs 13.7%) appeared to opt for ABM over other forms of treatment but the difference was not significant. Patrons between ages 41 and 50 years had the highest number of patrons opting for ABM but the difference was not significant. More patrons with previous experience buying animal parts from the market opted for ABM than first-timers (18.3% vs 11.4%) but there was no significant difference between them. Patrons who attained post-basic level education were 29.8% significantly less likely to opt for ABM as the first choice of medication compared to those who had no education (cOR = 0.298; 95% CI = 0.09 -0.982; p-value = 0.047). Adherents of Traditional African Religion were 2.6 times more likely to opt for ABM as first-line medication than other forms when compared to Christians (cOR = 2.607; 95% CI = 1.011 – 6.722; p-value = 0.047). Married patrons were 3.5 times more likely to use ABM as first-line treatment of illness than the unmarried (17.5% vs 5.7%; cOR = 3.531; 95% CI = 1.019 – 12.321; p-value = 0.047). When all other independent variables within the model were held constant, the adjusted odds ratio calculation found religious affiliation as the only significant predictor (aOR=0.238; 95% CI = 0.075 – 0.757; p-value = 0.015)

Table 6: Crude and Adjusted odds Ratios (95% Confidence intervals) from Logistic Regression Analyses Identifying Associations Between Patron's Social Demographic Characteristics and Choice of ABM as first Choice Treatment when Unwell

Independent variables		Dependent variable		Crude odds ratio (cOR) at 95% CI				Adjusted odds ratio (aOR) at 95% CI			
Biodata	Subgroups	Is ABM the first-choice medication?									
		No	Yes	cOR	p-value	Lower	Upper	aOR	p-value	Lower	Upper
Sex	Female [Ref]	55 (84.6%)	10 (15.4%)	1				1			
	Male	113 (86.3%)	18 (13.7%)	0.876	0.757	0.379	2.024	0.806	0.665	0.305	2.135
Age (years)	≤30 [Ref]	43 (93.5%)	3 (6.5%)	1				1			
	31-40	57(85.1%)	10 (14.9%)	2.215	0.181	0.652	9.696	0.755	0.734	0.15	3.815
	41-50	36 (80.0%)	9 (20.0%)	3.583	0.07	0.902	14.238	1.147	0.824	0.342	3.852
	>50	32 (84.2%)	6 (15.8%)	2.687	0.184	0.624	11.566	1.117	0.855	0.34	3.672
Highest level of education	None [Ref]	50 (80.6%)	12 (19.4%)	1				1			
	Basic level	62 (83.8%)	12 (16.2%)	0.806	0.633	0.334	1.949	1.598	0.503	0.405	6.309
	Post basic level	56 (93.3%)	4 (6.7%)	0.298	0.047*	0.09	0.982	1.872	0.33	0.53	6.612
Religious affiliation	Christianity [Ref]	57 (87.7%)	8 (12.3%)	1				1			
	Islam	70 (93.3%)	5 (6.7%)	0.509	0.258	0.158	1.641	0.394	0.101	0.13	1.199
	TAR**	41 (73.2%)	15 (26.8%)	2.607	0.047*	1.011	6.722	0.238	0.015*	0.075	0.757
Marital status	Unmarried [Ref]	50 (94.3%)	3 (5.7%)	1				1			
	Married	118 (82.5%)	25 (17.5%)	3.531	0.047*	1.019	12.231	2.409	0.211	0.608	9.539
Was the ABM bought for self-use?	No [Ref]	67 (81.7%)	15 (18.3%)	1							
	Yes	101 (88.6%)	13 (11.4%)	0.575	0.177	0.257	1.285	0.542	0.163	0.229	1.282

**TAR-Traditional African Religion

*Statistically significant. Patrons who were uncertain, did not make any choice, or did not respond to any of the questions related to their sociodemographic characteristics had their data omitted from the analysis. Ref: Reference group

Discussion

Most ethnozoology studies had respondents being ordinary inhabitants, households, or key informants in the communities which makes this study the first of a kind involving buyers of animal parts in the marketplace [18-22]. The results of this study found almost two-thirds (65.2%) of the buyers were males with about a third (32.7%) between the ages of 31 to 40 years. The possible reason for the dominance of the male sex is that besides the use of these animals for treating diseases, these animals are used for mystical purposes including protection against evil forces and acquisition of spiritual and physical strength which males and the youth in the 31 to 40-year brackets would be most desirous of achieving. Sodik and Jannah, (2022) just as found in this study, reported that people more than 30 years are significantly more likely to seek traditional health support when unwell [23]. In terms of religious affiliation of patrons, it would have been expected that believers of Traditional African Religion would patronize these animal parts most but in this study about three-quarters of the patrons ascribe to the two major religions in Ghana; Islam (38.5%) and Christianity (34.2%). This means that some followers of Islam and Christianity still visit traditional healers occasionally although such actions are frowned upon by these religions which consider Traditional African Religion as devilish. As reported by several previous studies, informal sector workers such as farmers, traders, and artisans among others patronize traditional medicines a lot more just as observed in this study which have less than 10% working in the formal sector [21-25].

This study found patrons of animal-based medicines opting for orthodox medicine as their first line of treatment whenever they are unwell. Some previous studies also found that users of traditional medicine still prefer orthodox medicine over traditional medicine when they have to choose between the two [11, 26, 27]. Animal-based medicine was the last option after herbal medicine in this study hence it is possibly being used as a complementary or alternative medicine. Again, unlike orthodox medications which may require daily use for chronic diseases, more than two-thirds (71.9%) of the patrons indicated they purchase animal-based medicines occasionally only when needed. The assertion that animal-based medicines may be complementary can be further corroborated by how often patrons visit the market for animal parts. Almost half (49.3%) of patrons indicated that within the previous six months, they had visited the vendor for animal parts between one and five times.

Although ABM may seem to be the least preferred first-choice medication option, individuals who patronize them are ardent users since almost four-fifths (79.5%) of persons who visit the vendors to purchase them were persons who had undertaken a previous purchase which for the majority of cases (60.1%), were meant for personal use. The importance of animal-based medicine goes beyond individual users since close relatives such as aunts, uncles, siblings, fathers, and mothers were among those who sent some of the patrons to purchase these animal parts. Besides the traditional healers, relatives, and friends seem to be the key personalities who influence the patronage of animal parts by those who patronize them.

Whenever these animal parts are used, in most cases, they are meant for the treatment of physical diseases (48.1%) and closely followed by mystical purposes (47.8%). This is contrary to re-

ports by Gbogbo and Daniels (2019) in Ghana and Nieman et al., (2019) from Cape Province of South Africa who reported 70% and 58% prevalence of spiritual or mystical uses respectively [28, 29]. What could account for the differences could plausibly be the different types of respondents in these studies. Whereas in this study, the respondents were those who had come to buy the animal parts, the respondents in the study by Gbogbo and Daniels (2019) were the vendors while Nieman et al., (2019) conducted the study among traditional healers [28. 29]. For nine out of ten patrons to agree or strongly agree that they are satisfied with the outcome of their use of the animal parts shows that there are very important demand factors worth considering. Although personal preference was the most important factor among patrons who opted for ABMs as their first line of treatment when unwell, the fast-acting effect, affordability, and accessibility of ABMs also encouraged some Ghanaians to patronize them. These reasons for opting for animal-based traditional medicines are similar to why some users of traditional medicines will choose herbal medicines as their first choice of medications when unwell [11, 30]. Two Ethiopian studies on animal-based traditional medicine also listed similar reasons why people patronize these natural resources [21, 31].

One unique reason for the use of animal parts as found in this study which is not reported for herbal or orthodox medicine is the use of animals for spiritual or mystical purposes such as protection, charming, and healing spiritual disorders among others. Although the spiritual importance of animals was also not reported by the majority of previous studies on zootherapy, some others found that the use of animals in African traditional medicines goes beyond the management of medical afflictions [22, 28, 29, 32, 33].

The predictor variables that could make a patron of animal-based medicines consider it as the first choice of medication over others were found in this study to be level of education, religious affiliation, and marital status. Persons with post-basic level education were about 70% significantly less likely to opt for animal-based medicines as their first option when unwell if compared with those with no formal education. Hailemariam & Mekonen, (2021), Tesfaye & Erena, (2020), and Gomez et al., (2021) reported that persons in informal work sectors use Traditional medicine a lot more [21, 24, 25]. Since persons with low-level education are mostly found in the informal sector, it explains why persons who are more educated were less likely to opt for animal-based medicine as their first-line treatment when unwell. This study also found persons who are adherents of the Traditional African Religion were 2.6 times significantly more likely to opt for animal-based medicines as first-choice medication when compared to Christians. Indeed, religious affiliation remained the only predictor when all other independent variables were considered together in the adjusted odd ratio statistical model. Traditional African religious rites and sacrifices involve the use of animals so it is understandable if their adherents will patronize animals for healing a lot more than followers of other religions. Although being married makes a person 3.5 times more likely to opt for animal-based medicines it is not so clear why marital status could be a significant factor.

The use of convenience sampling is a limitation in this study since the possibility of biases could not be avoided. However, it was not possible to use randomization since many of the buyers of the animal-based medicines were unwilling to be recruited into the study hence only persons who were available and willing could be respondents. However, this study which is possibly the first nationwide study involving patrons of animal-based medicine across the geopolitical regions of Ghana explored what these traditional medicines are used for and why they are used amid abundant and accessible herbal and orthodox medicine. Again, in this study, the respondents were persons who had come to buy the animal parts which makes their responses more dependable.

Conclusion

Even among users of animal-based traditional medicines, orthodox medications seem to be their foremost choice when unwell. However, several factors make such patrons continue to patronize these animal parts such as personal preference, affordability, and fast activity among others. Animal parts seem to find their unique role in conditions or situations that are considered to be spiritual or mystical. Being an adherent of the Traditional African Religion is a significant predictor in patronizing animal parts for traditional medicinal purposes.

Statement of Contribution

EPKA conceived the idea, collected and analyzed data as well and drafted the manuscript. EB collected data and drafted the manuscript. DKA, FG and JAS supervised the project and drafted the manuscript. BYO, SG and EA were involved in the drafting of the manuscript. All authors discussed the results and contributed to the final manuscript.

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article

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