Prevalence and Patterns of Herbal Medicine use in Bayelsa State: Potential Customers Victimology Insight for Behavioural Forensics

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Abstract: The need to affirm the ever rising patronage of herbal medicine through the prevalence and patterns with the view to explore potential victimology insight for behavioural forensics necessitated this study. The data of the study was generated from 1200 participants drawn from eight LGAs using structured questionnaire as instrument. Findings from the study revealed high prevalence (91.17 %) of herbal medicine use; age, sex, educational level and income were associated with herbal medicine use. The study also revealed that age group 30 – 39 years (34.74 %) of the studied population was found to be the predominant participants that used herbal medicine, more females (53.11 %) used herbal medicine compared to males (46.89 %), participants with primary school level of education were found to be the major users of herbal medicine followed by participants with secondary school level of education (31.17 %), also, low income earners were found to be the predominant users of herbal medicines. Non-infection (sex enhancement, weight loss, fertility), anti-infection (malaria, typhoid, cough, STDs), pains/pregnancy management, and others 34.55 %, 30.99 %, 25.05 %, and 9.41 % respectively were the health issues herbal medicine was used to manage by the participants. Findings from the study portrayed likely vulnerabilities of the participants to potential victims of sharp medical practices or medical fraud.

Keywords: Herbal medicine, healthcare, vulnerabilities, victims, sharp practices, behavioural forensics.

I. Introduction

The popularity and usage of herbal medicines is worthy of close attention. There is an increasing demand on the use of herbal medicines (HM) globally (Rocha *et al*., 2016). Similarly, Skalicka-Woźniak *et al*., (2016) highlighted that it is only less than 21% of the population in developing countries that do not use HM or traditional medicine as their primary healthcare needs. HM are preparations containing substances with therapeutic potencies obtained from one or more plants, raw or processed parts to benefit health of humans (WHO, 2000). Herbal medicine represents a natural form of healthcare which has experienced generational usage. About 75% estimated population of Nigerians prefers to solve their health problems with herbal medical products (Adesina, 2007). This potentiates a deep belief and reliance on herbal medicines for their health needs. Pirzada *et al.* (2009) and Onwordi *et al.* (2015) as an alternative to the ever increasing cost of orthodox health care systems, Nigeria and other African countries are in continuous patronage and consumption of these nonpharmaceutical forms of healthcare; with prevalence of over 60% among rural dwellers of the population (Onwordi *et al*., 2015; Esimone *et al*., 2002). The use of herbal medicine in Nigeria is common among adults and children with various forms of chronic illnesses (Amira & Okubadejo, 2007; Oshikoya et al., 2008; Ogbera *et al*., 2010), including pregnant women (Fakeye *et al*., 2009) and among a general population without chronic health conditions. Also, Duru *et al*., (2020) observed 72.5 % of 415 women interviewed in a study had used complementary and alternative medicine (CAM) for treatment of acute illnesses in children living in Yenagoa Bayelsa. The authors stated that 33.2% of the women used biological products (herbal concoctions) as their CAM practice. Gideon *et al*. (2016) observed that 97 % of two hundred and twenty-eight adolescent respondents in Amassoma (Bayelsa State) have used HM for treatment of various illnesses. 39 % of the respondents would prefer the use of herbal medicine to modern medicine. Their preference for HM to orthodox could be due to their dissatisfactions arising from the use of pharmaceutical therapeutic substances.

So many reasons have been adduced for the preference of HM. HM are premised to be without side effects, safe, sourced naturally and used widely in many countries for addiction treatment, sexual performance enhancing, weight gain and weight loss purposes (Foroughi *et al.,* 2017; Jalili *et al*., 2015). Onwordi *et al*., (2015) and Pirzada *et al*., (2009) asserted that Nigeria and other African countries maintains the patronage of HM as an alternative due to the skyrocketing cost of orthodox medical treatments. One other factor that encouraged many to embrace these drugs produced from plant root, leaf, stem and barks of tree considered to be safe,

accessible and economical as claimed by researchers (Carter, 2001; Chan, 2003) Ogunkunle and Ashiru (2011) also, highlighted that the increasing awareness of the cumulative pejorative effects resulting from the use of synthetic and antibiotics drugs remains a contributing factor for the preference of HM. Herbal medicine use is claimed to have circumvented all tribe in Nigeria (Falodun and Imieje, 2013). All cultural and traditional societies in Nigeria placed Herbal medicines use as their major method of healthcare system (Osuchukwu *et al.*, 2017). These nonsynthetic plant based drugs are believed to provide a fast and takes longer duration before the reoccurrence of another episode of infection (long-lasting healing) against infectious diseases like malaria (Belonwu, 2011). Herbal therapeutics are used generally for human wellbeing.

The Nigeria market of herbal medicine has gain multiplicity of these herbal remedies, increase in herbal preparation and formulation due to the upsurge of global awareness and their uses (Falodun and Imieje, 2013). This has further generated concerns regarding the likelihood of customers being exploited for herbal medicine patronage. Also, issues of adulteration and inappropriate formulation with possible adverse reactions that could lead to life threatening or lethal might arise. However, Duru *et al.* (2020) and Gideon *et al.* (2016) availing their research expertise on the promotion of Universal Health Coverage aimed at achieving sustainable development goal 3, investigated CAMs and herbal medicines used in Bayelsa State. Nevertheless, the authors only considered a town each from the two local governments in their studies. There is need to study all local governments in the State. A study involving all the local governments of the state on prevalence and pattern of HM use could generate new findings. This research was aimed at conducting a state wide survey on the prevalence and pattern of herbal medicine use in Bayelsa State with focus on potential customers victimology insight for behavioural forensics. This provide beter understanding on potential vulnerabilities and risks that may be exploited by fraudsters or scammers on herbal medicine usage. Thus, this study aims to consider all the local governments in Bayelsa State.

II. Research Methodology

Study Area

The State is located within latitude 4°15′ North and latitude 5°23′ south. It is also within longitudes 5°22′ West and 6°45′ East geographically. With regards to ethnicity, the State is predominately ljaw ethnic group whose members speak Izon language, Ogbia Nembe and Atisa including Epie as notable languages in the State. There is hand few of Urhobo and Isoko ethnic groups in the state. This research was carried out between June and July in Bayelsa State within the south-south geopolitical zone of Nigeria. The State is projected to be having 2,558,188 inhabitants from the 2006 census. A good number of adult occupants of the State engage in numerous economic activities as their livelihood. These economic ventures include employment (civil service/private sector), trading, farming and fishing. The study area is within the tropical rain forest.

Sample Size

The study was made up of males and females from 18 years and above. The sample size of the study was 1200 participants that gave informed consent. The sample size of the study was generated using Cochran (2007) formula for calculating a sample size based on a proportion of people who use HM for larger population. The sample size was calculated in accordance with Bryman and Cramer (1990) recommended values of standard deviation and error levels for social science research. Coupled with the fact of unknown proportion of HM users in Bayelsa State and assuming equal percentage (maximum heterogeneity) of HM users and nonusers. Hence, where 50% of the population being assumed to have used HM, a sample size of 1068 participants remains the minimum sample size required for this study.

Sampling Technique

A Multistage sampling technique was applied in this study with initial stage of selecting clusters of population units containing more units than required for a final sample (Mason, 2002), thereby stratifying Bayelsa State into its existing 8 LGAs. Stratified sampling was adopted to increase the efficiency of a sample design (Patton, 2005). An LGA constituted a stratum in this case to guarantee information on the use and knowledge of HM (Olanipekun, Kayode and Akomolafe, 2013). Two towns were selected from each of the LGAs through simple random sampling (SRS) to give each sample in the study population the probability of being selected (Mason, 2002) in the second stage of sampling. A total of 16 towns were selected from the 8 LGAs. At the third stage of sampling, five residential quarters were selected from each town same as the second stage. A total of 80 residential quarters were involved in the study. The fourth stage of sampling involved a systemic random sampling whereby 15 households were selected from each residential quarter in the third stage of sampling. A total of 1200 participants drawn from 1200 households (75 persons from each town, 150 persons from each LGAs) took part in responding to the questionnaire.

Data Collection

Maintaining focus on gathering information to observe the prevalence and patterns of HM use including association between variables, self-structured questionnaire was used as instrument for data collection (Bryman, 2012). Qualitative and quantitative

data were elicited from the respondents with open and closed-ended questions in the questionnaire. The questionnaire was administered with the help of research assistants, each questionnaire was completed within 15 minutes. The questionnaire was interpreted to participants that could not read or write. All information supplied by the respondents in each questionnaire was cross checked for error and incomplete entries by the researchers. Subsequently, verification of information relating to queries or mistakes was done with the research assistants or respondents. A 20-adult sample size in a semi-urban community (Biseni not part of the study) was selected at random for a pre-test of the questionnaire. The instrument of data collection was made up of questions on socioeconomic, demographic factors, Knowledge and use of herbal medicine, preference for herbal medicine use, and perception of effectiveness of herbal medicine.

Data Analysis

The quantitative aspect of the data was subjected to inferential and descriptive statistics using SPSS Windows (version 22.0) for analysis. Specifically, frequencies and percentages were used for descriptive statistics. Inferential analysis was carried out to associate socio-demographic factors and the use or non-use of HM. The influence of some independent variables on the use of herbal medicines was examined using Chi square test with P value ≤ 0.005 considered statistically significant. This was done to determine the associations between the socio demographic factors and herbal medicine use. According to Mehta and Patel (2012) Chi square test remains suitable for analysis involving the differences between expected and observed frequencies. Hence, the adoption of Chi square tests for data analysis.

III. Results

A total of 1200 questionnaires were self-administered and retrieved from the participants. The retrieved questionnaires formed the final sample size for the study.

Sociodemographic characteristics of respondents.

The socio-demographic features of the respondents revealed that age group 30–49 years (32.83%) was the major participants, more females participated (51.08%) than males (48.92%) in the study, the Primary School educational level (31.83%) were the highest participants, while majority of the participants (63.50%) were within the low-income group as presented in table 1.

Knowledge and use of HMs

As shown in table 2, all participants heard about HM (100 %), 91.41 % of the participants know HM and 91.17 % of the participants had used HM in the last two years, on the frequency of HM use revealed that 45.87% used them more than 10 times. More so, 34.55 % being the highest, used HM for Non-infection (Sex enhancement, weight loss, fertility) health issues.

Preference for HM use

Effectiveness was the major reason given why (31.54%) of participants preferred HMs as shown in Table 3.

Perception of effectiveness

To explore perception of effectiveness of HMs, our survey results showed that the majority of the participants (83.6%) perceived that HMs are effective as indicated in Table 4.

Table 1. Socio-economic demography of participants

Variables	Frequency	Percentages (%)
Age		
18-29	282	23.50
30-39	394	32.83
40-49	207	17.25
50-69	171	14.25
70 and above	146	12.17
SEX		
Male	587	48.92
Female	613	51.08
EDUCATIONAL LEVEL		
None	132	11.00

Primary	382	31.83
Secondary	356	29.67
Tertiary	330	27.50
ANNUAL INCOME		
Low Income (≤ 600000)	762	63.50
Middle Income(600001-2.4M)	312	26.00
High Income(>2.4M)	126	10.50

Table 2. Knowledge and use of herbal medicine

Variable	Frequency	Percentages (%)
Heard about HM		
Yes	1200	100.00
No	0	0.00
Used HM in the last two years		
Yes	1094	91.17
No	106	8.83
Know about HM		
Yes	1000	91.41
No	94	8.59
Frequency of HM use		
One-Twice	177	16.18
3-10 Times	502	45.87
Over 10 times	415	37.93
Health issues HM was used		
Anti-infection (malaria, typhoid, cough, STDs)	339	30.99
Pains or pregnancy management	274	25.05
Non-infection (Sex enhancement, weight loss, fertility)	378	34.55
Others	103	9.41

Table 3. Preference for herbal medicine use and conventional medicine dissatisfaction

Variable	Frequency	Percentages (%)
Why prefer HM		
Effectiveness	345	31.54
Affordability	287	26.23
Availability	219	20.02
Naturality	243	22.21

Table 4. Perception of effectiveness of herbal medicine

Variable	Frequency	Percentages (%)
HM Effectiveness		
Yes	917	83.82
No	177	16.18

Table 7. Association of Herbal medicine use and selected variables

Variables	HM use	HM Not use	Total	χ^2 /P
Age				
18-29	233	49	282	
30-39	380	14	394	χ^2 =54.998
40-49	193	14	207	P<0.001
50-69	165	6	171	df =4
70 and above	123	23	146	
SEX				
Male	513	74	587	χ^2 =20.314
Female	581	42	613	P<0.001
EDUCATIONAL LEVEL				df =1
None	107	25	132	
Primary	379	3	382	χ^2 =**100.016**
Secondary	341	15	356	**P < 0.001**
Tertiary	267	63	330	**df** =3
ANNUAL INCOME				
Low Income ($\leq$ 600000)	757	5	762	χ^2 =**282.237**
Middle Income(600001-2.4M)	212	100	312	**P< 0.001**
High Income(>2.4M)	125	1	126	**df =2**

IV. Discussion

A very high prevalence (91.17 %) of herbal medicine use was discovered in this study, the respondents admitted that they have used herbal medicine before at least once within the last two years. The study revealed high patronage of herbal medicine among the participants. This finding remains higher than previous studies in the study area. The discrepancy in finding could be due the population under study. Findings from this study was in tandem with previous researchers (Mbada *et al*., 2015; Uzobo and Abasiekong 2019; Onyiapat *et al*., 2011; Osuchukwu *et al*., 2017) whose findings were 96.8%, 88% and 84.7% and 80.50% respectively. More so, age group between 30 and 39 years appears to be the most common users of herbal medicines. The prevalence of HM use in this study could be attributed to availability, effectiveness, naturality and affordability. Shewamene, Dune and Smith (2020) identified 61.7% prevalence of herbal medicine products and services as the most frequently used traditional or complementary medicine by African migrant women in Australia. Their findings on the high and continued use of non-conventional medicine portrays a practice being accepted culturally by most African societies before the introduction of orthodox medicine (Mahomoodally 2013; Abdullahi 2011; Nelms and Gorski 2006). Similarly, Fasola (2015) attributed the wide usage of herbal plants in solving their health challenges to accessibility, availability, low cost and reliability. In another development, an ethnobotanical survey by Oreagba *et al*. (2011) claimed that the popularity of herbal medicine usage in Nigeria is solely their dependence on it for their healthcare. This finding on the high prevalence of herbal medicine use in the study area potentiate a great demand for plant based medical therapy; which could create opportunities for sharp or fraudulent practices by herbal medicine practitioners due to the available patronisers.

This study also revealed that age was associated with HM use. It was observed that the use of HM increases with age. This finding was in line with other researchers (Kelly, Kaufman and Kelley, 2005; Hoist, Nordeng and Honvik 2008, Kim *et al*., 2003; Kim *et al*., 2002). In another development, Ogunsola and Egbewale (2018) did not consider age as a predisposing factor of herbal medicine utilisation in their study. The authors discovered that age as a socio-demographic factor has no relationship with the utilisation of herbal medicines. The disparities in findings could be due to better educational exposure for informed decision or their location with better lifestyle that reduces their risk of health challenges. In the views of Lee *et al*., (2014), discrepancies emanating from different studies concerning age and nonconventional healthcare utilisation could best be explained with the scope of treatment, cultural and regional differences. The study revealed (Table 1) that 11.24 % of the participants (70 years and above) patronises herbal medicine. This finding portrays that this age group could be vulnerable or be at risk of being victims of herbal medicine sharp practices such as overpricing, exposure to adulterated or contaminated herbal medicines amongst others. Age remains a key factor in the disposition of victims to medical sharp practices. Elderly people due to their increased healthcare needs and their

reliance on healthcare providers makes them more vulnerable or be at risk of being victims of medical sharp practices, just as highlighted by others researchers (Templeton & Kirkman, 2007; Reisig & Holtfreter, 2013 and Mears *et al*., 2016) that older adults are more susceptible to fraud. Nevertheless, their finding was contrary to Nolte *et al*., (2021) whose study maintained that there is decrease in susceptibility to fraud or sharp practices in older adults than young adults.

On the aspect of sex and herbal medicine use, it has been shown that sex is associated with herbal medicine use in this study. This finding is in line with the work of Osuchukwu *et al*. (2017). Though, studies have shown that male were more inclined to the use of nonconventional healthcare services including herbal medicine utilisation than females (Okoronkwo *et al*., 2014). The authors attributed the greater male gender inclination to unorthodox health practices as strong belief of African men in traditional medicine. On the contrary, finding from this current study revealed that more females were inclined to herbal medicine use that males. This finding is in tandem with studies conducted in developed countries that found women to be more in tune with the use of alternative medicine (Bakhotmah and Alzahrani 2010; Barnett *et al*., 2003). Sex (gender) remains another major factor in the disposition victims of sharp medical practices. Women are potentially more vulnerable to medical fraud compared to their men counterparts as result of their high dependencies on healthcare services; they are more likely to patronise therapeutic providers be it traditional (herbal) or orthodox for reproductive healthcare services such as menopause management, contraception, fertility management and prenatal care. The finding on more women patronising herbal medicine than men in this study implies that more women could be at risk or vulnerable of being a victim to sharp herbal medicine practices.

This study addition, found educational level associated with herbal medicine use. There are multiple determinants involved in the complex decision-making process for healthcare services utilisation; in which the educational status of the individual is one important factor among others (Lee *et al*., 2014). On the consumption of HM, education level has been observed to have influenced herbal therapeutics use (Duru *et al.,* 2016). This could be due to the imperative role played by education in decision-making on the use of herbal medical products. For instance, it is most likely for one with better informed knowledge about the nature of herbal drug, its uses or its applicability and the ability to detect substandard products including how to use the herbal therapeutics to achieve the desired result as compared to those who have less knowledge about herbal medication and their uses. This current study agrees with Duru *et al.,* (2016) and DeLiema *et al*. (2023) but is however not in support of Osuchukwu *et al*., (2017) whose research established negative association between educational level of respondents and HM use. Their finding implied that as one gains more educational status, such individual patronages HM the less. Though, no clear-cut reason could be adduced for the variance in findings but a better knowledge on severe side effects of HM emanating from long time use or knowledge of likely adulteration and contamination HM. While Ogunsola and Egbewale (2018) in a different perspective found that there exist no association between educational level and the use of herbal medicines. Their work implies that educational level has no influence on herbal medicine use. In the context of potential victimology insight for behavioural forensics, this study discovered that more participants with primary school level of education patronises herbal medicine more than participants with tertiary school level of education. Educational level is considered as an important factor in the disposition of victims to sharp medical practices. Individuals with low educational level (none, primary and secondary level of education) are more likely to be vulnerable to victims of medical frauds; they appear to be likely less knowledgeable about their healthcare needs and to question healthcare providers about the qualities of their services including therapeutic products.

Income as a socioeconomic factor was found to be associated with herbal medicine use in this study. Previous studies on the influence of herbal medicine use by income discovered similar finding with this current study (Ogunsola and Egbewale 2018). Lower income earners were found to be the major participants found to patronise herbal medicine the more. This finding is in contrary to studies done by Duru *et al*., (2016) where they highlighted that lower income earners are more likely to use less herbal medicine compared to higher income earners. This could be applicable to a situation where herbal concoctions are marketed in some metropolis that made their accessibility dependent on its affordability. Also, where self-prepared herbal mixtures require long distance to source the plants parts; the cost implication could deter the usage of such herbal medication by lower income earner. On potential victimology of herbal use, it was observed from the study that participants with low level of education (69.20 %) remain the major users of herbal medicine. This could portray that these groups of participants are likely to be vulnerable to or be at risk of being victims of medical fraud due to their low financial resources and limited access to healthcare services; as these groups of individuals may be less educate also.

V. Conclusion

The ever rising patronage of herbal medicine use was studies to reveal potential victimology insight for behavioural forensics. The growing acceptance and utilisation of herbal medicine was confirmed in this study. High prevalence of herbal medicine use was discovered in the study; age, sex, educational level and income were found to be associated with herbal medicine use. The findings from the study implies that there are potential vulnerabilities or risks of the participants to be victims of medical sharp practices (medical fraud).

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