

Use of Herbal Medicine in the Management of Malaria in the Urban-periphery, Ghana

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Abstract

Herbal medicine use has been reported a common practice among individuals with clinical and complicated malaria but correlates of herbal medicine use among malaria subjects remain implicit. This cross-sectional study analysed the frequency of and factors associated with utilization of herbal medical services amongst malaria victims in urban-periphery, Kwabre East District, Ghana. A total of 189 malaria subjects and 5 traditional medical providers were respectively selected through systematic random sampling and snowball technique for the study. Structured and in-depth interview guides were utilised as the main data collection instruments. Whilst the quantitative data were analyzed using linear regression model through PASW for widows application software (v. 17.0), the qualitative data were subjected to content analysis. Results suggest that herbal therapy was trendy amongst malaria subjects (95, 50.3%) and a crux in malaria treatment efforts and strategies. Some participants (29.7%) however indicated pluralism of herbal and modern health care. Use of herbal medicine was significantly associated with perceived less side-effects, cost-effectiveness, efficacy and availability ($p < 0.05$). Besides, herbal medical practitioners were experienced and possessed a stash of knowledge of treating the disease. Preservation of traditional approach of malaria treatment and the medicinal plants required to boost the process is urgent. Research direction is recommended to unravel the safety and quality of medicinal plants not only in the treatment of malaria but other communicable diseases.

Keywords: Herbal medicine, Malaria, Perceived side-effects, Urban-periphery, Ghana.

1. Introduction

Malaria is a global scourge and remains one of the major public health challenges worldwide. The disease affects between 350 to 500 million of the world's population (Hopkins *et al*, 2007; Orwa *et al*, 2007; Souares *et al*, 2008). It is estimated that 247 million malaria cases exist among the 3.3 billion people who live in malaria endemic areas, putting their lives at risk (UNICEF, 2007; Njau *et al*, 2009). Among the 109 malarious countries and territories in tropical and sub-tropical regions, Africa, south of Sahara is hardest hit where over 90% of the estimated 1 to 2.5 million deaths occur annually. Between 20 and 40% of outpatient visits and between 10 and 15% of hospital admissions in Africa are attributed to malaria (Assenso-Okyere & Asante, 2003). This leaves a great deal of strain on the scanty orthodox health facilities in their quest to tackle the situation.

Malaria is hyper-endemic and a major life-threatening condition in Ghana. It causes 40-60% of outpatient leading to the highest morbidity and mortality in both rural and urban communities. Malaria is lethal among children under five and accounts for over 38% of all deaths in children (World Health Organisation [WHO], 2008b). Further, malaria in school children is a major cause of absenteeism in Ghana. It is estimated that about 2% of children who recover from cerebral malaria suffer brain damages including epilepsy. Indeed, the entire Ghanaian population is at risk.

There has been a significant international commitment and funding for malaria control. This initiative has over the

past 8 years been executed through such major international funding agencies as Global Fund to fight HIV/AIDS, tuberculosis and malaria, the US President's Malaria Initiative, and the World Bank's Booster Programme vis-a-vis the political goodwill and commitments shown by individual endemic economies (WHO, 2008a). However, apart from the side effects of use of orthodox medicine, empirical studies have expounded that malaria control and eradication are under constant threat. The parasite and vector have developed resistance to the traditional anti-malarial medicines and therapies such as chloroquine, amodiaquine and sulphadoxine-pyrimethamine (Orwa *et al.*, 2007). The prospects of malaria eradication therefore rest heavily on the outcomes of research and development for new and improved tools and mechanisms.

In June, 1998 and April, 2001, the Technical Consultations hosted by the WHO advocated for the use of a newer, safer, effective and effectual alternative; artemisinin-based combination therapies (ACTs) particularly in countries endemic with the *P. falciparum* malaria as first line treatment for mild and uncomplicated or clinical malaria (WHO, 2006). Following this direction, Ghana with 40 other African countries officially adopted ACTs in 2005. However, plant-based formulation ACTs is unaffordable (Beisel, 2010). This makes its implementation a huge challenge especially in low income sub-Saharan African countries including Ghana. Therefore, ACTs are still not readily accessible since only 3% of African children received ACTs (WHO, 2008b).

Additionally, studies on malaria drug treatment reported in 2008 that ACTs have started to fail in Cambodia, China, Myanmar and Vietnam following a confirmation of first cases of artemisinin-resistant malaria (Malaria Consortium, 2009). There is also the possibility that the ATCs lose their effectiveness in Ghana as happened to chloroquine in the late 1970s. This brings to a spiky focus how necessary it is to identifying and developing malaria treatment alternative which is apparently, traditional medical therapy.

The efficacy and potency of herbal medicine (HM) is justified and indeed attracting global attention (Gyasi *et al.*, 2011; Kaboru *et al.*, 2006). The frequency of use of HM is increasing worldwide, and is well documented in African region and other global populations to be between 20% and 80% (Osamor & Owumi, 2010). The malaria endemic countries in Africa *de facto*, have herbs for treating the fever that must be tapped with urgency.

Factors that accede the choice and use of herbal HM have long been unravelled. Researchers and policy makers have debated it out but not explicitly understood (Lorenc *et al.*, 2009). Patients may choose to use HM because they are dissatisfied and uncomfortable with conventional treatments that are perceived to be ineffective, expensive or have unpleasant side effects (Sutherland & Verhoef, 2004), while others also find HM attractive because it is consonant with their personal values, religious and health philosophies (Bishop *et al.*, 2007). Indeed, there are mixed reasons for HM use by malaria patients. This study was primarily conducted to examine the pertinent determinants of HM use and to investigating the prevalence of HM in the management of malaria in urban-rural transitional Kwabre East District of Ashanti Region, Ghana.

2. Data and methods

2.1 Study design and variables

This research depicts a cross-sectional survey involving urban-periphery, the Kwabre East District of Ashanti Region, Ghana. This is one of the malaria holo-endemic districts in the region. The survey involved malaria subjects of 20 or more years of age and HMPs who manage and treat malaria patients. This age limit of patients was based on the fact that by 20 years, *ceteris paribus*, individuals are independent and can decide for themselves the health seeking behaviour and the treatment modality to access when afflicted with malaria.

Malaria subjects recruited for the study were in different socio-economic vis-à-vis broad cultural and residential backgrounds. The study employed both quantitative and qualitative approaches; a quantitative study of malaria patients in the community and a qualitative study of HMPs practising in the community. Two primary-aggregated sets of data were used together with secondary information sourced from archives and documents. The independent variables included demographic, socioeconomic and psychosocial variables. The utilization of HM was used as the outcome variable. Variables such as effectiveness, cost-effectiveness or affordability, availability and side-effects of use of HM were measured per the perception and satisfaction of the respondent in relation to the orthodox medical care.

2.2 Study setting, sampling and data collection

This study was conducted in Kwabre East District of Ashanti, Ghana. The total population of the district stands at 115, 556 of which females constitute 52.3%. Sixty-five per cent (65%) of the district remains rural (Ghana Statistical Service, 2012). Kwabre East District has 14 health facilities owned by the government and private missions. These health facilities are situated in the urban half of the district. There are also registered patent medicine stores or pharmacies and traditional healing homes in the district, which are more accessible to members of the community. The National Health Insurance is in operation in the district. Albeit, longer distances that malaria patients must cover in order to access the few health facilities available and other intervening obstacles such as travel time, travel cost, waiting time at the health facilities before seeing a physician, etc, debar majority of the people, from hospital attendance altogether.

Malaria was the single medical problem on which people reported most at the outpatient department (OPD) and remains the main cause of admission. Trends portray that 41252, 47727 and 49437 of malaria cases were registered at OPD in 2009, 2010 and 2011 respectively. With respect to the causes of admission moreover, malaria constituted 41.4% (292) amongst the top ten diseases in 2009. It plummeted slightly to 38.6% (267) in 2010 and rose again to 50.5% (321) in 2011 (Kwabre East District Health Directorate, 2011). Malaria afflictions are on ascendancy in the district and have taken a toll on the people and their socio-economic endeavours.

Nine communities in the district were carefully selected for this research, viz. Mamponteng, Aboaso, Ntonso, Abira, Abirem, Antoa, Kenyase, Bosore and Brofoyedu. A total sample of 203; 198 malaria subjects and 5 traditional medical providers was selected respectively through systematic random sampling and snowball technique. Structured and in-depth interview guides were employed as the main data collection tools, given room for both literate and the illiterate respondents to fully participate in the study. Each interview lasted averagely for 30 minutes.

Ethical clearance was obtained from the Committee on Human Research and Publication Ethics, School of Medical Sciences, Kwame Nkrumah University of Science and Technology, Kumasi. Study participants were assured of the anonymity and confidentiality of the information they provided and signed consent form before the commencement of the data collection exercise.

2.3 Data Analysis

With PASW (v. 17.0), the quantitative data were analyzed using linear regression (Stepwise method). This identified the various explanatory variables that were potent to predict the herbal medicine use. The interpretation of the regression results took consideration the interaction term of less than or equal 0.05 ($P \leq 0.05$) as significant. Data were depicted by frequency tables and percentages. The qualitative data obtained from the HMPs who managed malaria in the study communities on issues relating to their beliefs, knowledge, practices, and experiences were then analyzed thematically with direct quotes.

3. Results

3.1 Quantitative study

3.1.1 Characteristics of the study sample

Table 1 presents the characteristics of the sample used in the survey. A total number of 189 respondents were involved in the quantitative study. This comprised 88 females and 101 males. About one-half of the study participants had attained the age cohort of between 20 and 29 years. This was lopsided against old people who had 60 years or more indicating that traditional medical care, indeed has prospects. Most of the respondents (63%) were married, employed and also belongs to the Christianity. Respondents with tertiary education constituted the lowest cluster, representing 10% of the total sample. Moreover, approximately 75% of the study participants resided within the urban half of the prefecture.

Majority of the 85% of the respondents who are employed are engaged in such economic activities as petty trading, civil service and artisanal ventures. The number of people who reap their livelihood from farming and other primary economic activities is quite low since the size of the arable land within the rural-urban transitional belt was nothing home to write about. A vast agricultural land in the study communities is almost pushed into built environment. The income of the respondents was quite low with 75% of the study subjects receiving below GH¢400 (\$200) per month, leading most people into the poverty level. This is attributed to the fact that most of the respondents did not have sustainable jobs. Petty trading is uncertain whilst casual jobs hardly pay much.

---Table 1---

3.1.2 Health care seeking and frequency of use of HM

Table 2 illustrates the different health facilities and places where the study participants sought health care when they were afflicted with malaria. Despite the fact that large proportion, almost one-half of the respondents indicated that they sought medical condition from the orthodox health facilities, *inter alia*, the District Hospital, Community Health Centres and the various private hospital in the district, some respondents indicated an exclusive usage of the HM as a mechanism to treat malaria. Also, a good number of the people expounded the need to pluralise the various forms of medicine at their disposal.

---Table 2---

It was found that chemist/pharmacy shops, patent medicine, drug vendors/open markets, local shops, self preparation, etc were examples of sources where malaria victims obtained their treatment apart from traditional and orthodox health facilities.

---Table 3---

It is of interest to note that all respondents reported they have consulted or used HM at least once in their life time. About 27.5% of the overall sample used HM and sought care with HMPs whilst 16.9% used HM but did not seek care with HMPs. Among those reporting use of HM the main forms used were: leaves, bark and root. These plant products and resources are mostly mixed, boiled together and bottled.

3.1.3 Factors associated with the use of HM by malaria subjects

The association of various demographic, socio-economic and psychosocial factors with the use of HM was investigated using linear regression. The variables that entered into the regression model include age, sex, monthly income level, highest level of education, marital status, religious background, residential status, effectiveness, cost effectiveness, side-effects and availability of herbal medicine, being independent variables and use of HM, being the dependent variable. The stepwise regression method was employed to derive the regression results and this is indicated in Table 4.

---Table 4---

The results of the regression analysis give credence to side-effects, effectiveness, affordability and availability of HM as factors that significantly explain the use of HM in the study area ($P < 0.05$). It is interesting to appreciate that none of demographic and socio-economic variables such as age, sex, marital status, income level, educational level, etc predicted the use of HM. The model is credible since the Adjusted Regression Square (R^2) stands high.

3.2 Qualitative Study

3.2.1 HMP's Perception related to causation, symptomatic and prevalence of malaria

The study has demonstrated that most of the HMPs are specialists in the treatment of malaria and its concomitant fever. The views of the practitioners in relation to the causation, severity and prevalence suggest that the condition is endemic in the urban-rural transitional zone of Kumasi Metropolis. It was found that HMPs have profound knowledge regarding the causes of malaria. Eighty per cent (80%) of HMPs interviewed averred that malaria is caused or transmitted by the bites of mosquitoes. They have good knowledge about clinical signs and symptoms of malaria and can distinguish it from other forms of fever. Every HMP indicated at least 3 signs of the disease though; none of them were able to give an indication of the specific breed of mosquito that carries the plasmodium parasite. Three out of 5 HMPs claimed malaria can be fatal on the population especially children, expectant mothers and people of lower socioeconomic classes. The following quotes illustrate these facts.

“The owners of *atiridii* (malaria) are mosquitoes and they distribute it freely to anybody they meet anywhere through bites. It does not respect anybody as it can affect males and females alike especially pregnant women and children”. “Malaria is not just like any other disease. It can invite all sort of fever on you and easily makes you feel very weak. It makes one have flu-like symptoms, severe headache and vomit, increased body temperature and loss of appetite. In children, malaria easily brings about convulsion which kills them thereafter. Although, HIV/AIDS is

dangerous, malaria can kill better if it is not diagnosed and treated early with proper approach. Malaria always moves with its casket and carries whoever it meets". "Mosquitoes survive and thrive in humid and bushy surroundings especially where stagnant water lurks. If you don't keep your immediate surrounding clean, malaria will come and stay with you".

3.2.2 HMPs' experiences and practices in the management of malaria

The mean age and years of practice of the healers is 68 and 12 years respectively. It was reported that HMPs deal successfully with malaria problems presented to them with 3 days on average. The research found that the HMPs possess a pool of knowledge and the resources that are potent to managing malaria in the study prefecture. An interview with the practitioners showed that a number of plants and plant products such as leaves, roots and bark are commonly used to arrest the perils of malaria. HMP had this to say: "I started treating malaria when I was only 18 after the death of my father from whom I got trained. People from different locations visit me for medicine and they come back to tell me they are cured" "Malaria victims come to me for help. My medicines are obtained from plants. I combine leaves, roots, bark and other items like lime, ginger, garlic, etc to prepare malarial medicine. The medicines are prepared in the form of concoction and decoction. Plants such as *dua kankan* (neem tree), *prekese* (*tetrapleura tetraptera* or *taub*), *nunum*, *iba*, *nkran gyedua*, *ankodie*, etc are tapped to prepare malaria medicines".

The practitioners had strong conviction that not only their patients complied with the treatment they prescribed and offered them but they also used orthodox medicines principally obtained from pharmacy or chemical shops.

3.2.3 HMPs' perception relating to reasons that malaria victims seek HM care

Different views were given by HMPs in relation to why malaria victims utilise their services. HMPs avowed that patients use their services because it is relatively expensive and time consuming to see the doctor (hospital). Waiting time at orthodox medical facilities may exacerbate and complicate the conditions of malaria subjects. It is again relatively difficult to afford drugs prescribed for them. National health insurance is in vogue though; patients are compelled to purchase most of the drugs on prescription form. A quote from one of the HMP further explicates this assertion. "It is very difficult seeing a doctor at hospital; a patient has to be in a long queue for a long time". "Majority of them come to us when they are sick and cannot afford hospital bills. They prefer coming to us because we are within the community and we are easy to reach".

The cost involved in the orthodox medical care came up several times in each interview. HMPs reverberated that they offer the advantages of lower costs, ability to extend credit and allowing patients to pay in instalments. "A patient might not be able to offer initial and prompt payment for the medicines we give them. We all know how hard this season is. If they don't have money, we allow them to pay later, probably after they get well".

The practitioners gave credence to the efficacy of HM in the treatment of malaria as one major reason patients utilise it. It was reported that herbal medicine has the potency to curing malaria directly from the blood once the patient carefully takes the course prescribe them.

4. Discussion

The prefecture exhibits a mix character of rural and urban settings where malaria is the single most dreadful infectious medical condition. Current global trend indicates that malaria incidence and morbidity has plummeted by 17% since the year 2000 and malaria-specific mortality rates have decreased by 25% (United Nations, 2012; WHO, 2011). However, the situation in sub-Saharan Africa is nothing to boast of and the scenario in Ghana in general and Kwabre East District in particular is of no exception.

Different health care modalities and approaches are utilised in Ghana as in the case of other parts of developing world including orthodox hospitals, traditional healing, spiritual churches and pharmacies, etc (Kofi-Tsekpo, 2006). Even in Advanced countries where sophisticated orthodox medicine is available, the use of various forms of HM is evident. Nearly 50% of the study sample who used HM was within the age brackets of between 20 and 29 years. An increasing population globally is turning to HM use. Over 80% of the HMPs involved in the survey were *au fait* with the cause, clinical signs, nature and diagnoses of malaria and therefore the traditional therapy used in treating malaria is purposefully intended. This is akin with a previous study in Kenya that reports 75% of healers having in-depth knowledge of malaria and its treatment (Orwa *et al*, 2007).

The study found that about 50% of the malaria subjects used HM to managing the disease and its concomitant fever. This is congruent with the estimate of 46% reported by Tabi *et al* (2006). Although, some patients exclusively depended on HM, it is noteworthy that medical pluralism was common. Patients complemented medical system with others to ensure comprehensive health care required to arrest pertinent medical challenges in the country. This gives credence to the feasibility of integrating the two medical systems of traditional and the orthodox health care in Ghana. Various attempts have been executed to incorporate the two medical systems, but frantic efforts ought to be made by the government through the Ministry of Health, Ghana Health Service and other health related Non-Governmental Organisations to fully make HM a part of the public health system in Ghana (Gyasi *et al*, 2011; Majori, 2000).

This research has established that the principal factors that correlate the use of HM by malaria victims are cost-effectiveness, less side-effects, efficacy and availability of HM. It is quite fascinating that none of the demographic and socio-economic variables significantly explain the use of HM in the study prefecture. The hypothesis that higher income and educational levels of malaria patients is associated with HM use has not been justified by the survey results. This is inconsistent with previous studies that report some level of significance of the use of HM with such demographic and socio-economic characteristics as age, sex, income levels, etc (Osamor & Owumi, 2010). This could be based on the fact that the previous study was undertaken in a different African country where the socio-economic and the demographic characteristics of respondents largely differ from the participants of the current study.

Cost-effectiveness and flexibility is strongly associated with the use of HM. The hypotheses that the utilization of HM is associated with affordability and availability have therefore been vindicated. HM is widely used in the prevention, diagnosis and treatment of myriad of ailments. In some regions, HM is more accessible. In fact, a third of the world's population and more than one-half of the populations of the poorest parts of Asia and Africa do not have regular access to essential drugs. In the developing countries socioeconomic status is amongst the key health determinants throughout life course (Buor, 2008). Most people lack adequate and regular source of income that could offer them the needed access of health care. With easy access and mechanisms of deferred payments, malaria subjects mostly rely on the services of the HMPs as far as the management of their medical condition is concerned. Indeed, HM provides an important health care service to persons both with and without geographic or financial access to modern and orthodox medicine. Policy options in relation to the information on practitioners including their qualification, registration, educational background, location, number and the products used in their practices should be streamlined (Ministry of Health, 2009). The training and upgrading of the knowledge of the HMPs is therefore brought to urgency so as to warrant the safety of their services particularly for malaria clients.

Efficacy and less side-effects of use of HM have emerged as key factors influencing the use of HM in the study prefecture. The hypotheses that effectiveness and less side-effect correlate the use of HM have been proved correct. Herbal products are often promoted to the public as being natural and safe (Adewunmi & Ojewole, 2004). Herbal preparations are produced by subjecting herbal materials to extraction, fractionation, purification, concentration, or other physical or biological processes. HM for malaria are in the form of concoction. Therapeutic synergies are produced by different plant species involved in the preparation. Also, one plant species may neutralises the toxic effects of other plant species whilst allowing the active portion to alleviate malaria fever and that HM is considered having limited side-effects in the process of treatment.

The survey portrays that utilization of HM corresponds to the patient's ideology and health philosophies, belief and trust (Bishop, 2007). The patients report being free from malaria after using the herbal preparations and that they rely on it as such. The research initiative on herbal anti-malarial created in 1999 aimed at cataloguing the current knowledge on traditional methods and validating the use of HM for the prevention and or treatment of malaria. Efforts toward the mapping of medicinal plants used by HMPs have been initiated in Africa, though, adequate record keeping by practitioners, adequate facilities for diagnosis and the use of standardized products must be reckoned. Amidst, the development of local production and conservation of medicinal plants for treating malaria and the need for legislation of the practice of HM and its integration into conventional health services must be prioritized. This is to create the avenue for HM in malaria control programmes in the future.

4. Conclusion

The survey posits that utilization of HM is popular amongst malaria subjects in the peripheral zone of the Kumasi Metropolis, the Kwabre East District of Ghana. Various forms of medicinal plants are used either from personal preparation or obtained from HMP. Although the practitioners exhibit an in-depth knowledge about the causes,

symptoms, effects and treatment of malaria, they were not an exclusive source of health care to the study subjects as other sources were used in addition. Besides, the efficacy rate, cost-effectiveness, less side-effects, availability and accessibility remain the variables that independently associated the malaria patients with the use of HM. It is therefore envisaged that HM lingers a conduit of actualising MDG 6 of skimming HIV/AIDS, malaria and other diseases. The policy implications that are urgent include the preservation of both traditional approach of malaria treatment and the medicinal plants required to boost the process from extinction. Education and training of the HMP will subsequently impact the trust between the patients and healers and finally ameliorate the efforts to merge the traditional and orthodox medical systems. Further research direction is recommended to unravel the potency of specific medicinal plants used in the treatment of malaria and other communicable diseases.

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Table 1: Characteristics of the sample

Variable	Category	Frequency (N)	Percent (%)
Age of Clients (in years)	20-29	89	47
	30-39	46	24
	40-49	32	17
	50-59	17	9
	60+	5	3
Sex	Male	101	53
	Female	88	47
Marital Status of Clients	Single	70	37
	Married	119	63
Highest Level of Education	Never	51	27
	Basic	72	38
	Secondary	47	25
	Tertiary	19	10
Residential Status of Client	Urban	141	75
	Rural	48	25
Religious Background of Respondents	Christianity	120	63
	Islam	63	33
	ATR	6	3
Employment Status of Patients	Employed	161	85
	Unemployed	28	15
Monthly Income Level of Clients (GH¢)	<200	56	30
	200-390	85	45
	400-590	28	15
	600-790	13	7
	800+	7	4

Source: Based on Field Data, 2012.

Table 2: Health seeking and treatment modality for malaria subjects

Category	Frequency (N)	Per cent (%)
Traditional medicine	39	20.6
Orthodox medicine	94	49.7
Combination of health care	56	29.7
Total	189	100.0

Source: Based on Field Data, 2012.

Table 3: Care seeking at HMP and use of HM by 189 malaria victims

	Use of HM		Total
	Yes	No	
Care seeking at HMP	52 (27.5)	9 (4.8)	61
	32(16.9)	96 (50.8)	128
	84	105	189

Source: Based on Field Data, 2012.

Table 4: Regression Results

Variable	Coefficients	Significance (<i>P</i> - value)
Affordability of herbal medicine	0.491	0.006
Side effects of herbal medicine	0.241	0.009
Effectiveness of herbal medicine	0.200	0.032
Availability of herbal medicine	0.210	0.034
Adjusted Regression Squared (R^2)		0.743

Dependent Variable: Use of herbal medicine

Source: Based on Field Data, 2012.

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