Demand for Complementary and Alternative Medicine in Ghana

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Abstract

The acceptance of Complementary and Alternative Medicine (CAM) by many countries, including Ghana, into the formal component of healthcare delivery system has been slow, even though the system could contribute towards accessible healthcare.An analysis of the consumption pattern of CAM among people could assist policy in terms of what specific type of CAM could be useful as far as consumer preference is concern. The study found that, households in the low income brackets, as well as people with low levels of education use CAM more. Also most costs variables were found to be significant determinants of CAM use. Given these findings, it is recommended that orthodox healthcare be made more accessible since demand for CAM is low and restricted largely to the poor and illiterates.

Keywords: Complementary and Alternative Medicine, Healthcare, Ghana, Binomial Distribution and Logit Regression.

1. Introduction

Complementary and alternative medicine (CAM) covers a heterogeneous spectrum of ancient to new-age approaches that support to prevent or treat disease. It includes the use of herbs, traditional spiritual healing including bone setting. The system is not part of conventional medicine because there is insufficient proof that CAM practices are safe and effective (Barnes et al, 2008). This, notwithstanding,there has been reported increase in demand for CAM both in the developed and developing countries (see for example Blackman, 2006; Osborne, 2006; McDonough et al, 2007).

In Africa, and Ghana for that matter, inadequate number of the already ill-equipped health facilities coupled with the limited availability of trained personnel at the facilities could make alternative medical practitioners an important part of the health care system. Many people in South Africa, for example, do not consider traditional medicine an inferior alternative to western medicine. To them, traditional medicine is desirable and necessary for treating a range of health problems that western medicine does not treat adequately (Mander et al, 2008).

Prescott-Allen & Prescott-Allen (1982) argue that up to 80 percent of the world's population rely primarily on so-called "traditional" medicine for primary health care. In many developing countries, it appears the majority of the population depends on traditional remedies partly due to poverty, but also because traditional systems seem more culturally acceptable, and are able to meet the psychological needs in a way that western medicine does not. Balicket al (2000) allude to the fact that traditional healing systems vary across cultures even though they often focus on balance and harmony, which may be treated mentally, physically, or spiritually.

The concept of indigenous development advocates the incorporation of indigenous knowledge systems and practices into modern systems in the quest to solve society's development problems. To this end incorporating CAM practices into the formal healthcare delivery system could go a long way to enhance not only the health needs of the people but also the general welfare of society by promoting the cultural values of the people. To be able to adequately incorporate the two systems however it will be necessary to come to terms with consumption pattern of CAM among people because that is what seems less understood, especially in the area of isolating critical determining factors affecting the consumption of CAM.

The Upper West Region (UWR) of Ghana is the poorest in the country (GSS, 2005) with very few and unevenly distributed healthcare facilities. The region also has very poor road infrastructure making it difficult for people to travel to these facilities. An analysis of the demand for CAM in the region aimed at possible inclusion of CAM in the health system will relieve the people of the problems associated with inadequate access to healthcare services.

The study thus sought to investigate the factors affecting households' decision to use CAM.The overall objective of the study was to assess the demand for CAM in Ghana using the UWR as a case study. Specifically, the study sought to find out the level of patronage of alternative medicine in the UWR; establish the characteristics of people seeking CAM; and determine the factors accounting for the decision to use CAM.

2. Methodology

2.1. Study design

The study uses a survey design and employs the multistage sampling procedure to draw a representative sample. The region was clustered into rural and urban, based on the population size to take care of the rural urban dichotomy. A location is classified as urban if its population size is 5,000 or more but is rural if the population size is less than 5,000 (Ghana Statistical Service, 2005).

The simple random procedure (involving lottery) was used to select Gwollu, the district capital of Sissala West District to represent the rural districts and Wa Municipality to represent the urban category. The number of households in the urban district category was 11,369 whiles that of the rural district category was 458 (Ghana Statistical Service, 2005). The regional average for all the district capitals however is 1942, which implies that the urban average has a wider deviation of about 1941 while the rural average has a deviation of 1553. Consequently, a larger sample was drawn from the urban category. The dependent variable, whether or not a person seeks treatment from CAM provider, is categorical. In this case Bartlett IIet al (2001) propose the use of Cochran's sample size formula. Assuming there is an alpha of 0.05 Cochran's sample size formula for categorical data is

$$N = \frac{(t)^2 * (P)(q)}{(d)^2} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)\ ,$$

where; N is the sample size to be determined, t is the value for selected alpha level of 0.025 in each tail = 1.96, p is the proportion of the sample that became ill and sought treatment, q is the proportion that did not seek treatment and d = acceptable margin of error for proportion being estimated = 0.05 (the maximum error acceptable in this study).

From a pilot survey conducted earlier, 0.75 proportion of households were ill and sought treatment in general. This gives p = 0.75 and q = 1-p =0.25, in which case the sample size becomes 288, which was rounded to 300 to take care of maximum error.

To ensure representativeness, the sample size was distributed according to the proportion of households in the two locations. About 80 percent of the total number of households in the two selected towns was in Wa, while 20 percent was in Gwollu. In this sense 80 percent of the sample size which is 240 households was drawn from Wa, while 20 percent of the sample size which represents 60 households, was drawn from Gwollu. In all, six communities were systematically selected from Wa and four communities randomly selected from Gwollu. Houses were also systematically selected from the communities, then one household from each of the selected houses was then selected using the random procedure for data collection.

2.2. Data Analysis

Following Mwabu et al (1993), a patient or his relative is assumed to choose the healthcare alternative that yields the maximum expected utility. Conditional on seeking treatment, the direct utility derived by individual i from treatment alternative j can be expressed as

$$U_{ij} = u_{ij}\ (h_{ij}, c_i) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

where U_{ij} is the direct conditional utility for individual i after receiving treatment from provider j, h_{ij} is the amount of healthcare received by individual i from provider j and c_i is the consumption of non-healthcare goods by individual i, and the amount consumed does not depend on choices j.

To facilitate empirical work, the unobserved variable, h_{ij} can be expressed as:

$$h_{ij} = h(x_{ij}, z_{ij}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

whereh_{ij} is as previously defined, x_{ij} is a vector of observable socio-economic attribute of individual *i* and z_{ij} is a vector of attributes faced by individual *i* in facility *j*. Similarly,c_i can be expressed as:

$$C_i = y_i + e_{ij} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

whereC_i is as previously defined, y_i is annual income of individual *i* and e_{ij} is the value of resources that individual *i* devotes to care received from facility *j*.

Assuming that the utility function in Equation (2) is linear in health status and quadratic in consumption, and is consistent with well-ordered preferences, it will generate typically observed demand patterns. In this specification, it is the variation in monetary or time prices across healthcare providers that ensure identification of behavioural parameters. Given this role of prices, and a further assumption that consumer preferences over the entire range of consumption goods are well defined, empirical healthcare demands can be said to be consistent with the assumption that ill individuals maximise an indirect conditional utility function V_{ij} as shown in equation (5) (Mwabu et al, 1993):

$$V_{ij} = v_{ij}(x_i, z_i, y_i, r_{ij}, a_i) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

wherex_i, z_iandy_i are as previously defined, r_{ij} is the price of healthcare received by individual *i* from health facility *j* and a_i is the price of non-healthcare good consumed by individual *i*.

Equation (5) is the standard expression for the indirect utility function in consumer theory. In the present context it shows the maximum utility that individual *i* can achieve, conditional on seeking treatment for illness, controlling for income, healthcare prices, prices of other goods, individual socio-economic attributes and facility specific characteristics. In this case all ill persons will choose the treatment with the highest value ofV_{ij} .

By their discrete nature, healthcare demand models can only identify the relative propensity of choosing one of the alternatives. Furthermore, all the elements of the indirect conditional utility function in Equation (5) are directly observable and are the variables of interest to policymakers. The final step in econometric implementation of the model requires the standard assumption that the utility function in Equation (5) is stochastic, and is of the form:

$$V_{ij} = v_j^* + u_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

wherev_j^* is the systematic component of utility and u_i is an additive disturbance term.

Assuming u_i is normally distributed and v_j^* is restricted to one type of provider, equation (6) leads to a binary logistic specification of individual choice of the particular provider. The logistic formula derives from assumptions about the characteristics of the choice probabilities, namely the independence from irrelevant alternatives (IIA) property. This property says that for any two alternatives *i* and *k*, the ratio of the logistic probabilities does not depend on any alternatives other than *i* and *k*. This is to say that the relative odds of choosing *i* over *k* are the same regardless of what other alternatives may be available or what qualities these other alternatives may possess (Train, 2003).

Suppose that $\pi(x) = E(Y/x)$represents the conditional mean of *Y* given *x* when the logistic regression is used, the specific form of regression becomes:

$$\pi(x) = \frac{u_i^{\alpha+\beta X}}{1 + u_i^{\alpha+\beta X}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

The logit transformation of equation (7) defined in terms of $\pi(x)$is given as:

$$g(x) = \ln[\pi(x)/1 - \pi(x)] = \alpha + \beta X \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

which ensures that $g(x)$ is linear in parameters and may be continuous (Hosmer & Lemeshow, 1999). Assuming the value of the outcome variable given x is $Y = \Pi(x) + \varepsilon$then ε may assume one of two possible outcomes. If $Y = 1$, then $\varepsilon = 1 - \Pi(x)$ with probability $\Pi(x)$, and if $Y = 0$ then $\varepsilon = -\Pi(x)$ with probability $1 - \Pi(x)$. In this caseHosmer and Lemershow (1999) argue that ε has a distribution with mean zero and variance equal to $\Pi(x)\,[1 - \Pi(x)]$, which follows the binomial distribution with probability given by the conditional mean $\Pi(x)$.

Following from these arguments, the specific model that was estimated in this study is presented as:

$$P\ (AP) = \beta_0 A + \beta_1 LOS + \beta_2 FOS + \beta_3 IHH + \Phi_1 NHIS + \Phi_2 PXF + \lambda_1 COT + \lambda_2 PAP + \lambda_3 TAF \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (9)$$

where, $P\ (AP)$is the probability that an individual seeks CAM, A is the intercept term,LOS is the level of schooling of the individual, measured in terms of educational attainment as in basic, secondary etc, FOS measures how often the individual falls sick, IHH is the income level of the household head, measured in hundreds of Ghana cedi and μ is the disturbance term. β_0, β_1, $\beta_2$and$\beta_3$are the coefficients of A, LOS, FOS and IHH respectively whichare the socio-economic attributes of the household. The *a priori* sign for level of schooling is negative. This is because it is likely that people who have high schooling level may appreciate the risks involved in opting for CAM compared to western medicine.Similarly households with higher income should be able to adequately access western.

NHIS is a dummy variable seeking to know if the individual is a registered member of the National Health Insurance Scheme; and PXF is a dummy seeking to find out if the facility visited is the nearest, $\Phi_1$andΦ_2 are coefficients of NHIS and PXF respectively which are access variables. It is expected that an insured person will seek CAM less since most practitioners are not licenced by the National Health Insurance Authority (NHIA).

COT is the amount paid at the facility visited and is measured in Ghana cedi; PAP is household's perception about payment and TAF is time taken (in minutes) at the facility visited, λ_1, $\lambda_2$andλ_3 are the coefficients of APF, PAP and TAF respectively which are costs variables.The *a priori* signs of most costs variables are expected to be negative in line with the theory of demand. However, the perception about the treatment is expected to have a positive effect. If people perceive that the amount paid for the treatment is less costly in relation to treatment outcome or some other considerations, they are likely to opt for CAM irrespective of the absolute amount paid. See Table 1 for definition variables and summary statistics.

Table 1: Definition of variables and summary statistics

Variable	Definition	Measurement	Mean	Std. Deviation
CAM	CAM use	0 = no; 1 = yes	0.293	0.455
LOS	Level of schooling	0 = no schooling; 1= primary; 2= JSS/JHS/Middle school; 3= secondary; 4= post sec; 5= university/polytechnic	1.812	1.898
FOS	Frequency of sickness	1=not frequent; 2=frequent; 3=very frequent	1.290	0.537
IHH	Monthly income of household head	1=below GHs 200; 2=GHs 200 – GHS 299; 3=GHs 300 – GHs 399; 4=GHs 400 – GHs499; 5= GHs 500 & more	1.83	1.159
NHIS	Health insurance registration status	0=no 1=yes	0.750	0.433
PXF	Nearness to facility	0=no 1=yes	0.728	0.444
COT	Cost of treatment	1=below GHs 5; 2=GHs – GHs9; 3=GHs 10 – GHs 14; 4=GHs 15 – GHs 19; 5=GHs 20 & more	1.700	1.108
PAP	Perception about treatment	1=payment was cheap 2=payment was moderate 3=payment was expensive	2.053	0.821
TAF	Time spent at facility	1=less than 1 hour; 2=1-3 hours; 3=4-7 hours; 4=more than a day	2.329	1.105

N = 1433 N (for IHH) = 300

3. Results and Discussions

3.1. Patronage of CAM in the UWR

The common forms of CAM in the UWR include herbal medicine, spiritual healing and local orthopaedic (bone setters) services. These services are carried out mostly by unregistered practitioners at their houses. Except in the case of the local orthopaedic services in which a kind of informal recognition has been given by Ghana Health Service in the region to two operators (one in Gwollu and the other in Doun), where accommodation is provided for patients who have to be attended to over a period of time, the rest of the practitioners operate at home.

From the study, it was discovered that some household members resorted to CAM in times of sickness. About 29 percent of the sample visited CAM providers while the rest of the 70.1 percent did not use CAM. In this regard, even though people patronise CAM, the level of patronage is low, indicating that the demand for CAM is not that high. Results in Table 2 show that the most common form of CAM used was herbal medicine which accounted for over 80 percent of the 29 percent, while the least patronised was the spiritual healing which accounted for less than 3 percent of the 29 percent.

Table 2: Form of CAM patronised

Form of CAM patronised	Frequency	Percent
Herbal medicine	343	82.06
Spiritual healing	9	2.15
Local orthopaedic (bone setters)	66	15.78
Total	418	100.0

These findings are similar to the general trend of CAM use in most countries which usually range from 7 percent to 40 percent in most cases even though very few countries recorded a patronage rate of about 80 percent (Onyapatet al, 2011) but contradict findings in South Africa where the consumption of CAM is reported to be widespread and growing, with consumer demand for better quality medicinal plant products increasing (Mander, et al, 2008). This state of affairs could be attributed to the fact that most CAM providers are not registered in Ghana and are operating at the household level.

3.2. Characteristics of CAM users

From the study, it was found that people who attained very low levels of education tended to use CAM more. The results in Table 3 indicate that out of the 418 people who used CAM a higher proportion (37.56%)did not have any formal schooling. This was followed by 21.53 percent and 21.29 percent respectively for those who attained primary and junior high level of schooling respectively. Those with tertiary level of schooling used CAM less. The chi^2 value of 19.76 was significant even at the 1.0 percent level.

Table 3: Cross tabulation and chi^2 test

Relationship between demand for CAM and Level of Schooling						
	None	Primary	JHS/JSS	Sec/SHS	Post sec	Tertiary
CAM	37.56%	21.53%	21.29%	9.33%	2.39%	4.07%
other	30.15%	24.83%	16.85%	12.32%	4.73%	6.6%
		Chi^2 = 19.76		p – value = 0.006		
Relationship between demand for CAM and monthly income of household head						
	<200	200-299	300-399	400-499	500 & above	
CAM	59.38%	13.54%	13.54%	7.29%	6.25%	
Other	55.88%	20.59%	14.22%	5.39%	3.92%	
		Chi^2 = 3.080		p – value = 0.545		
Relationship between demand for CAM and amount paid for treatment						
	<GH□ 5	GH□ 5- GH□ 5	GH□ 5- GH□ 5	GH□ 5- GH□ 5	GH□ 5- GH□ 5	
CAM	77.62%	15.58%	4.25%	1.13%	1.42%	
Other	37.74%	23.11%	17.92%	12.26%	8.96%	
		Chi^2 = 1.128	p – value = 0.0001			
Relationship between demand for CAM and time spent seeking care						
		< 60 minutes	1hr -3hrs	4hrs -7hrs	>1 day	
Use CAM		70.53%	9.18%	9.90%	10.39%	
Did not use CAM		12.25%	31.91%	32.58%	23.26%	
		Chi^2 = 4.529	p – value = 0.0001			

Also, results in Table 3 show that over 59% households whose heads earn less than 200 Ghana cedis; while 7% of households whose heads earn between 400 – 499 Ghana cedis. This implies that households with lower incomes tend to use CAM more.The chi^2 value 3.080 was however not statistically significant even at the 10.0 percent level.

Cost of seeking treatment was an incentive for the use of CAM. As shown in Table 5 reveal that over 77 percent of CAM users paid less than GH 5 for treatment. The implication is that CAM is less costly and people are motivated by this to use it. The chi^2 value of 1.128 was statistically significant even at 1.0 percent level.

To find out the effect of non-monetary cost on the use of CAM, the time spent receiving care was compared with its use. From Table 3, it shows that over 70 percent of CAM users spent less than an hour receiving treatment. The chi^2 value of 4.529 was significant even at the 1% alpha level. In this case waiting time tends to discourage the use of CAM services.

3.3. Determinants of CAM use

The correlation test of significance used above only indicates the direction of association but falls short in bringing out the effect of one variable on the other. In order to find out the effects of the explanatory variables on the use of CAM, it was important to do regression analysis. Equation (9) was estimated and the results are presented in Table 4. The Wald's test of joint significance reveals that all the explanatory variables jointly explain the demand for CAM at the 1 percent alpha level.

Table 4: coefficient effects & odds ratios of logistics regression

Variable	Coefficient	Odds ratio	p-value
LOS	-0.018	0.982	0.885
FOS	0.025	1.025	0.960
IHH	-0.110	0.895	0.537
NHIS	-0.885	0.412	0.137
PXF	-0.899*	0.407	0.087
COT	-0.638**	0.529	0.012
PAP	-0.367	0.693	0.187
TAF	-0.867***	0.420	0.001
Wald $chi^2(8) = 27.43$, Prob>$chi^2 = 0.0006$;			

Apart from frequency of sickness (FOS) which has a positive effect on the use of CAM, the rest of the explanatory variables have a negative effect on the use of CAM. Proximity to facility for example, has a significantly negative effect on the probability of using CAM. The odds ratio of 0.407 implies that people who are nearer to CAM practitioners tend to visit them less. These findings are contrary to those by Winston and Pate (1995) that ease of access and convenience are the primary considerations for choosing a traditional healer.

Similarly time spent at the facility receiving treatment had a significant but negative effect on the probability of using CAM. The odds in favour of use of CAM reduce by 0.693 at the 1 percent alpha level given that an individual had to spend an additional hour seeking treatment. Even though the odds in favour of the use of CAM reduce by 0.412 for insured persons this was not statistically significant even at the 10 percent alpha level. In their work, Wolsko et al (2002) and Barnes et al (2008) found that high frequency users of CAM were full or partial insurance coverage of the CAM provider, compared with no coverage of CAM provider. In Ghana most CAM providers do not have insurance coverage because the system is largely informal, and this is probably accounting for negative effect of insurance on CAM use.

These findings show that cost considerations are more important for consumers of CAM. In contrast Muela et al (2000) argue that cost is not the reason for using CAM but because CAM approaches uses practices that resonate with people's beliefs about health.

Generally, socio-demographics factors are not important in determining the use of CAM. The findings contract studies by McDonough et al (2007) in the United Kingdom where socio-demographic factors were found to be important. In that study it was found that, four out of ten respondents using aromatherapy (41%) did so for relaxation. In that study CAM use was more common in those aged in the 35-44 and 45-54 year age bands, and in females (56% in females compared to 36% in males).

4. Conclusions and Recommendations

Contrary to claims that CAM in its various forms enjoys high patronage the world over, this study found that CAM use among consumers in Ghana is low. Indeed, far less than half of the sample population opted for the system.

In terms of factors affecting the use of CAM the study found that, socio-demographic factors were less important determinants of demand for CAM, even though level of education exhibited a significant but negative correlation.Implication is that the illiterate population use CAM more than the literate population.

In line with consumer theory, both money and non-money costs were found to be significant determinants of demand for CAM. Generally, amount paid for treatment and time spent receiving treatment negatively affected the use of CAM. Most CAM providers charged very little (less than GH 5) while most patrons spent less than an hour receiving treatment.

Since preference for CAM is generally low, it does not seem likely that the system offers itself as a viable alternative means to solve the country's healthcare needs even in a poor region such as the UWR. In this regard, it is recommended that stakeholders in the health sector put in place measures that will make the conventional western medicine more accessible to people than it is now. For example, expansion of both the health infrastructure and other social infrastructure such as roads and electricity could be considered.

Also, since patrons of CAM are mostly the less educated, one can say that these people are opting for CAM due to low cost regardless of the possible risks involved in the use of CAM. In this regard,it is recommended that public education especially at the community levels should be carried out on the dangers and risks involved in the use of CAM. As it is now, the prospects of integrating CAM into mainstream medicine is low as it might turn out to be waste of time and resources. If the idea must be considered as proposed by advocates of CAM, then there is the need to put in deliberate effort by all stakeholders in the health sector aimed primarily at making the system more acceptable in the first place. It is only then that integration could make some economic meaning.

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