Annals of Health Research
Volume 2, Issue No. 1
January - June 2016

ORIGINAL RESEARCH

The relationship between accessibility of health facilities and the prevalence of self-medication practices in a developing region

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Abstract

Background: The well-being of a population can be influenced by their access to health care services. The prevalent practice of self-medication in developing countries may be a reflection of the inefficiency of the health care system. The practice of self- medication may lead to more serious health problems. This study examined the access of the people to health services and its implication on the practices of self-medication in Ogun State, Nigeria.
Methods: The study area was stratified into urban and rural settlements and 120 respondents were randomly selected as the study sample. The study used the logit regression model to examine how characteristics of individuals and their views on access to health facilities affect the practice of self-medication. The predictive ability of the regression model showed that 95% of the outcome was correctly predicted.
Results: The examination of the effect of the predictor variables on the outcome of the model showed that "years of schooling", "perception of distance", "acceptability" and "availability" predicted the practice of self-medication. The availability factor had the greatest influence on the practice of self-medication.
Conclusion: Health policy planners in developing countries should improve determinant factors such as availability of health care services and their acceptability in the short term. In the long term, the level of education and the distances to health facilities should be improved.

Keywords: *Access, Health system, Logit regression, Self-medication*

Introduction

It is well documented in the literature that provision of health care services and accessibility of such services are major determinants of health [1, 2] Inadequate or lack of access to health care facilities can have a negative impact by encouraging the practice of self-medication. The practice of self-medication can lead to more serious health problems with the higher cost of care. Indeed, it may result in withdrawal of children from schools and sale of major assets among the poor families in order to raise funds as reported in Pakistan by Heltberg and Lund. [3] The prevalence of the practice of self-medication can be taken as a reflection of the quality of access to efficient health care. The practice also depends on the environment and lifestyle of individuals.

The literature on the location of public facilities focused attention on the role of physical access to the facilities. [4 - 7] In such studies, accessibility refers to the ease of movement to activity locations. Some previous studies have shown a relationship between a measure of accessibility (such as distance or travel time) and the utilisation of health services while other studies have shown a lack of correlation. [7] This observation has highlighted that access to public facilities goes beyond spatial access.
Access to health services can, however, be cribed

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described from different perspectives. There is no universally accepted definition of access to health. [8] A useful basis for examining and understanding access to health services and their utilisation is the Andersen model. [9] The conceptual model of Andersen recognises the complex nature of access to and utilisation of health services. Moisi *et al* [5] called for a renewed examination of the social, behavioural and quality of care factors that impede access to preventive and curative health services. It is along this line that the present study used the choice model to explain the relationship between demographic characteristics of individuals, their perception of access to health facilities and the type of health care service they utilised. The choice model can be used by health policy makers to formulate reform plans for the health sector in order to reduce incidences of self-medication. The objective of this study was to examine the access of a Nigerian population to health services and its implication on the practices of self-medication.

Methods

Study Area

The study location was Ijebu North Local Government Area of Ogun State, Nigeria. This local government area was chosen to represent a typical region in the developing world. It consists of only three urban settlements while the remaining settlements are rural in setting. This pattern allowed the assessment of rural-urban divide on the practice of self-medication.

The headquarters of the local government area (LGA) is located in Ijebu-Igbo and it is located at the northern end of Ogun state. It is approximately located between latitude 6^0 55' and 7^0 N and between longitude 3^0 45' and 4^0 05'E. The total land area of the LGA is about 967 square kilometres. The 2015 projected population of the area was 235,075 based on the 2006 population census by the National Population Commission.

Health facilities in the study area were classified according to their ownership as publicly or privately-owned. The publicly-owned health facilities in Ijebu North LGA consisted of one general hospital (a secondary health facility) and 24 primary health care centres (locations of public health facilities are depicted in Figure 1). The privately-owned health facilities were categorised into orthodox health facilities, traditional healing homes and spiritual healing homes. There were mixtures of the different types of health facilities and "trado-medical" hospitals, where traditional healing practices were mixed with orthodox medicine. The patent medicine shops also served as health care outlets in many settings in the developing world. There were 38 registered privately-owned orthodox health facilities in Ijebu North LGA in addition to 38 registered patent medicine shops. [10] There were no records of the number of traditional and spiritual healing homes and there were numerous unregistered patent medicine shops within the LGA.

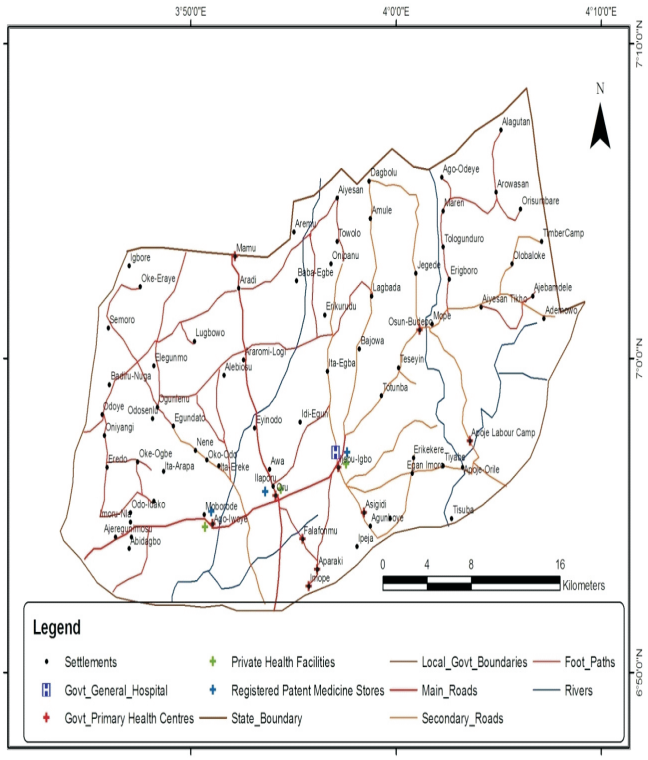

Figure 1: Map of Ijebu North Local Government Area

Data used for the study

The main data used for this study was obtained from a survey carried out in Ijebu North LGA of Ogun State. One hundred and twenty (120) questionnaires were administered. The number of questionnaires was 0.05% of the total 2015 projected population and this number was adopted for convenience, given the time and

resources available for the study. An equal number of questionnaires (60) was administered in urban and rural settlements in the LGA to make the finding truly representative of the area.

All the urban settlements in the study area were included in the survey. Although 162 rural settlements were listed in the population data of the LGA, [11] only 71 settlements were identified on the map of the area. Fourteen (20%) of the 71 rural settlements were randomly selected and visited for the survey. In the urban settlements, 20% of all the streets were randomly selected and included in the survey. In Ijebu-Igbo, 25 of the 127 identified streets were selected; 17 out of the identified 87 streets in Ago-Iwoye and six out of the 17 identified streets in Oru-Awa-Ilaporu were also selected for the survey. The houses on the selected streets were numbered and the list of numbered houses was used to randomly select the houses visited during the survey. In the rural settlements, streets were not well defined in some cases and enumerators simply moved across the length and breadth of the settlements and the respondents they encountered were interviewed.

Variables used in the study

The dependent variable of interest in this study was self-medication practice. To simplify the research design, the symptoms for which the respondents sought medical care were limited to fever, body ache, headache, abdominal upset, cough or catarrh.

The independent or explanatory variables (see Table I) used in the logit model in this study were of two types. Discrete choice models were used to relate two categories of explanatory variables to the choice made by each person. The two groups consisted of those relating to the choice maker attributes and the attributes of the alternatives available to the person. [12] The first category of variables in this study was derived from the characteristics of the individuals. These characteristics included age, years of schooling, income and rural-urban nature of residence.

The second category of variables bordered on four of the dimensions of access recognised in the literature: geographic accessibility, availability, affordability and acceptability. [13] The ture, social respondents were asked about "their perception on the barrier to the four factors with respect to the existing health facilities." In this study which involved the prediction of the outcome of a certain behaviour (i.e. practice of self-medication), data covering culture, social interaction and the demographics of the people (the *predisposing factors) were used as input. Limited number of* independent or predictor variables was used in this study for the following reasons:

(a) To keep the logit regression model as simple as possible. A minimum of 10 events per independent variable has been recommended. [14] The maximum number of independent variables that can be used is dependent on the number of respondents who practise self-medication.

(b)The variables required to capture the culture and social interactions of individuals will be numerous and it is assumed that the selected variables are surrogates and covariates of some of these potential variables. Examples include the number of years of schooling and the level of knowledge of health care possessed by a respondent.

Method of Analysis

Discrete choice models are used to estimate the probability that a person chooses a particular alternative. The models are used to forecast how people's choices will change under changes in demographics and/or attributes of the alternatives. [9] The logistic regression or prediction equation for this study was specified as follows:

$y = \log(p/(1-p)) = \beta_0 + \beta_1*X_1 + \beta_2*X_2 + \beta_3*X_3 + \beta_4*X_4 + \beta_5*X_5 + \beta_6*X_6 + \ldots$

Let y be the binary outcome variable indicating failure/success (in this study, it was 'practise self-medication'/ 'do not practise self-medication') with 1/0 and p be the probability of y.

βo is the intercept and β1, … βk are the regression coefficients of X_1, X_2, X_3, … respectively. Let X_1, …, X_k be the set of predictor variables as defined in Table I and listed below. The independent variables were dichotomous, discrete or continuous. The dichotomous variables were coded as 1s and 0s. For example "acceptable = 1" and "not acceptable = 0."

X_1 = Dist_Percep
X_2 = Accept
X_3 = Afford
X_4 = Avail
X_5 = Reside

Table I: Details of the variables used in the regression model

Variable name	*Meaning*	*Options*	*Reason for choice of variable*
	Dependent variable		
Self_Med		Use drug without consulting health facilities = 1 Consult medical practitioners in health facilities = 0	This is the outcome variable. The
	Independent variables (attributes of the alternatives)		
Dist_Percep	Geographic accessibility: how the respondent perceived the distance to the source of drugs he uses by self	Distance to drug source is closer compared to health facilities = 1 Distance to drug source is NOT closer compared to health facilities = 0	The distance to a health care source as a determinant of usage has been emphasized in the literature. The perception of distance is assumed relevant here as the dependent variable is behavioural. Perception can sometimes be more influential than reality.
Accept	Acceptability: How the respondent view the acceptability of self medication	It is acceptable to use drug by self = 1 It is NOT acceptable to use drug by self = 0	The perception of the respondent on the acceptability of self administration of drugs will determine if a respondent will use a health practitioner.
Afford	Affordability: How the respondent perceived the cost of using drugs without consulting a medical practitioner	It is cheap and affordable to use drugs by self = 1 It is NOT cheap and affordable to use drugs by self = 0	The cost factor is a determinant of the type of healthcare a respondent will use. It includes the cost for transport, service and the drugs.
Avail	Availability: How the respondent perceived how readily he is able to obtain drugs he uses by self	It is readily available = 1 It is NOT readily available = 0	Availability of information on health facilities/ services, opening hours, waiting time, etc will determine the type of health care outlet a respondent will use.
	Independent variables		
Reside	The rural or urban nature of the residence of respondent	Urban = 1 Rural = 0	respondent resides is a determinant of physical access to health and can condition the behavior of the residents.
Age	Age of respondent		The age of the respondent will determine the maturity, ability to be able to control self, etc
Edu	Number of years of schooling of respondent		The number of years of schooling will determine some other attributes of the respondent like the elitist status, the level of knowledge and awareness, level of discipline, etc.
Income	Average monthly income of respondent		The income is a determinant of the ability of the respondent to afford transport cost and service cost of a health practitioner

X_6 = Age
X_7 = Edu
X_8 = Income

Results

It is shown in Table II that, most of the respondents were between 18 and 45 years (66.67%) and 70% of them were married. Some of the respondents (43.33%) spent between 6 and 9 years in school, (attending the primary and junior secondary schools) while another 36.67% of the respondents had up to 12 years of schooling.

The proportion of people who practised self-medication in this study was 76.7% as shown in Table II. On the frequency of practice of self-medication, 43.3% bought drugs for self-medication more than five times during the past one month.

The overall significance of our logit model was tested using the Chi-Squared test. The SPSS® (version 15)-generated result for our data had a Chi-Squared value of 98.82 at 8 degrees of freedom and the test indicated that the effect of the independent variables taken together on the dependent variable was significant. The Nagelkerke R square given as 0.85 indicated a strong relationship of 85% between the predictors and the dependent variable. One way to assess the goodness of the regression model is to look at the proportion of cases that has been classified correctly. In this study, the classification table (Table III) shows that 95 % of the cases were correctly classified.

The result of logit regression in Table IV shows that "years of schooling", "perception of distance", "acceptability" and "availability" contributed significantly to the prediction of the practice of self-medication. The probability values under the sig. column show that they are significant at 5% level of significance. The values under the Exp (B) column are the odd ratios. The odds ratios for "years of schooling" was 1.54 (95% CI: 1.06-2.24); the odds ratio for "acceptability" was 144.339 (95% CI: 6.51-3202.18) and 1215.11 (95% CI: 20.8-71006.63) for "availability." These were greater than 1 and the probability of their outcome increased. The odds ratio for "availability" was highest and that implied it had the highest influence on the probability of an individual practising self-medication. The probability of the perception of availability of drugs on the outcome of the practice of self-medication was 99.9%. The odds ratio for "perception of distance" was less than one and thus, the probability of self-medication was lower for those that were far from sources of drugs which they could have used for self-medication.

Table II: Characteristics of the respondents

Characteristics	Frequencies	Percentages
Gender		
Female	56	46.7
Male	64	53.3
Age		
Below 18 years	4	3.33
18-45 years	80	66.67
45-60 years	22	18.33
Above 60 years	14	11.67
Marital status		
Married	84	70.0
Single	36	30.0
Monthly income		
Less than N18,000	8	6.7
N18000 – N50,000	68	56.67
N50,001 – N120,000	40	33.33
Above N120,000	4	3.33
Number of years of schooling		
Below 6 years	8	6.6
6 – 9 years	52	43.33
9 – 12 years	44	36.67
Above 12 years	16	13.33
Practised self-medication		
No	28	23.3
Yes	92	76.7
Frequency of buying drugs for self-medication		
None *	30	25.0
Once	14	11.7
Twice	22	18.3
3 to 5 times	2	1.7
More than 5 times	52	43.3

*Two of these who did not buy drugs for self - medication actually took herbal preparations.

Discussion

Physical or geographic distance has been emphasised in the literature as a key determinant of access to health care services. [5 – 7] Some previous studies have shown that there could be other determinant factors apart from the physical distance. [10] It is shown in the present study that, the key determinant of access to sources of drugs for self-medication was actually the availability factor. This is because, apart from the pharmaceutical drugs that are obtained from the patent medicine shops, the use of herbal mixture is also a common method of treating ailments in the population studied.

The distance was also a significant determining factor of access to drugs for self-medication. The perceived distance was used in this study rather than the actual distance or time of travel. There are known difficulties with the use travel distance and travel time in studying access to health facilities. [5] The use of perceived distance is justified in this study which was carried out in an area where the conditions of the different categories of roads were heterogenous. For example, travelling experience along the same distance on a tarred urban road and untarred rural road or footpath in the rainy season in the tropics can vary greatly. Perception of distance in a study like this can be taken for the actual distance since the outcome of the relationship being examined was behavioural in terms of the practice of self-medication.

Table III: Cross-tabulation of predicted and observed frequencies of self-medication practice

		Predicted		
		Practice self medication		
Observed		No	Yes	Percent correct
Practice self medication	No	24	4	85.7
	Yes	2	90	97.8
Overall percentage				95.0

Table IV: Logistic regression output

Variables	B	S.E.	Wald	Degrees of freedom	Sig.	Exp (B)	95% CI for Exp (B)	
							Lower	Upper
Reside	1.20	1.57	0.59	1	0.44	3.32	0.15	72.08
Age	-0.02	0.04	0.27	1	0.61	0.98	0.90	1.06
Edu	0.43	0.19	5.16	1	0.02	1.54	1.06	2.24
Income	0.00	0.0	0.09	1	0.77	1.00	1.00	1.00
Dist_percp	-4.45	1.61	7.59	1	0.00	0.01	0.00	0.27
Accept	4.07	1.58	1.13	1	0.00	144.34	6.51	3202.18
Avail	7.10	2.08	11.71	1	0.00	1215.11	20.79	71006.63
Constant	-4.60	3.38	1.86	1	0.17	0.01		

Dependent variable – Self - medication practice

The urban-rural residence was not a significant predictor of the practice of self-medication in this study. Self-medication was observed to be as prevalent in the rural areas as it was in the urban areas. In spite of the fact that all the patent medicine stores in the study area were located in the urban areas, the people living in the rural areas bought drugs for self-medication whenever they had the opportunity to visit the urban settlements. The rural dwellers also took self-prepared herbal mixtures. The prevalence of self-medication in the rural areas could be attributed to the distances from health facilities.

The role of income, as a predictor of self-medication in our model, was expected to be significant. It was assumed that people with higher income can afford to visit health facilities for medical treatment. If we had controlled for occupational groups, perhaps, income would have been significantly related to the practice of self-medication in the model. People in a certain occupation, such as the commercial motorcycle operators, are known to earn above average income and are more prone to taking local herbal mixture which presumably serve as pain relieving drugs after the day's work.

Conclusion

This study has demonstrated how the choice model can be used to forecast how people's choice of where they obtain health care will change with their attributes and perception of the availability, acceptability and distance of health care outlets. The factors identified as significant determinants of the practice of self-medication in this study can be used to plan appropriate interventions in the short and long terms.

In the short term, identified mutable factors (factors that can be easily changed) such as availability of drugs for self-medication and their acceptability can be addressed. The availability of drugs for self-medication can be reduced by regulating their sales at the various outlets. The availability of health services should also be improved by providing information, increasing opening hours, reducing waiting time, at the existing health facilities. Through public enlightenment and education on the side effects of the self-administered drug, the popularity of the practice of self- medication can be discouraged and reduced.

In the long term, the perception of the distance to health facilities can be addressed by providing more health posts (formerly known as dispensaries) where the drugs for the treatment of common ailments can be accessed at subsidised rates to reduce the incidence of self-medication.

Author's Contribution: This research was carried out solely by the author.
Conflict of Interest: None
Funding: Self-funded
Publication History: Submitted 09-October 2015; Revised 16-December 2015; Accepted 01-March 2016

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