Original Research Article

MEDICAL CHOICES FOR A WEALTHY NATION - A MULTINOMIAL LOGISTIC MODEL

Abstract

This study investigated the Effect of Levels of Education on the Choice of Medical Treatment Options for three illnesses (Malaria, Mental Disorder and HIV/AIDS) in Nigeria. The study was carried out in ten randomly selected Local Government Areas (L.G. As) in Imo State using a stratified random sample of 500 individuals selected from a population of 194,932 and the data was collected using questionnaires. The Multinomial Logistic Regression Model was adopted in the analysis of the data. The result of the analysis showed that there was a significant association between Educational Level and choice of treatment of Malaria, Mental Disorder and HIV/AIDS. It was further discovered that it is only the "WAEC/GCE" level of education that is significant in the Choice of Treatment of Mental Disorder. It is therefore recommended that government should beam its searchlight on this educational level to find out the cause(s) of their Mental Disorder.

Keywords: Multinomial Logistic Regression, Education, Choice, Medical Treatment Options, Stratified Random Sample.

1.0 Introduction

Health is generally acknowledged as wealth. This is so, because only the healthy people in any given human population can work and generate wealth in one form or the other. Also, a healthy citizen is an asset for national development especially if he/she possesses the various forms of knowledge, skills, attitudes and experience required for harnessing, mobilizing and manipulating human and material resources for social, economic, environmental and political transformation of peoples' lives.

Health has been reported to be influenced by several factors, ranging from social and cultural to economic [1]. Health has also been linked to poverty, morbidity, mortality, social networks and social support ([2]; [3]). In the report of their joint research work, [4] stated that there is considerable international evidence that education is strongly linked to health such as healthy behavior and preventive service use.

Asada and Kephart [5] have found that in Canada, the level of education of their respondents influenced their healthcare usage practices. People with higher education were more likely to opt for healthcare services as compared to their less education counterparts. [6] reported that in the United States of America, people with more years of education are more likely to be sensitive towards their health and are better aware about access to their healthcare options. In a study done in Greece, [7] found that the level of education not only influence the healthcare usage but also the type of healthcare services provider used by an individual. They reported that people with lower education are more likely to use the emergency department healthcare services as opposed to people with university education who were more likely to use government funded primary healthcare services for similar needs. They used the student t-test and Analysis of Variance (ANOVA) in a Univariate analysis in assessing the differences in physical and mental health across the socio-demographic characteristics.

Sabina [8] highlighted Malaria as the most severe public health problem with the greatest number of cases in Nigeria. According to [9], out of 20 service users attending the outpatient clinic at Rumuigbo Neuropsychiatric hospital, there is only one Neuro-psychiatric hospital for over four million people in the Niger Delta region of Nigeria. Again, Nigeria is the second largest country with about 3.8 million people living with Human Immune Virus (HIV) with a higher conversion rate of Acquired Immune Deficiency Syndrome (AIDS) due to poor medical treatment options by the patients [10].

According to [11] various individuals especially the rural dwellers often make wrong choices in the treatments of certain illnesses. These wrong choices to medical treatment options have been argued to have some relationship with the level of education of these individuals. However, to the best of our knowledge the nature of the relationship between level of education and choice of medical treatment options has not been empirically investigated in Nigeria. It is against this backdrop that this study was initiated in order to empirically establish the effect of education on the choice of medical treatment options amongst selected rural communities of Imo State, Nigeria.

Rajendran et al. [12] used systematic sampling data that was generated from active investigation to study the yearly change of inferential age groups of acute diarrheal patients infected with Vibrio cholera during 1996-2000. They used the Multinomial Logistic Regression (MLR) for their study and Vibrio Cholera is significant with children under the age of five in India. [13] in 2012 applied

Multinomial Logistics Regression to study physical violence against children in Palestine with a data reported in the year 2003 by Palestinian Central Bureau of Statistics (PCBS). The model adequacy and assumptions were tested and the results were able to predict the classification of any individual case.

The ultimate objective of the study is to determine the effect of education on the choice of medical treatment options amongst some selected rural communities of Imo State, Nigeria. Specifically, we fitted a multinomial logistic regression model to the choice of medical treatment options, determined the effect of level of education on the peoples' choices in the event of Malaria, Mental Disorder and HIV/AIDS. The adequacy of the fitted multinomial regression models were also tested.

2.0 Research Methodology

The data used in this work was collected from a primary source. A sample size, n of 500 from a population, N of 194,932 was selected using [14]. The sampling design was a two-stage sampling method. First, a Simple Random Sampling technique was used in selecting some Local Government Areas (LGAs) from Imo State; and second, a Stratified Random Sampling method with proportional allocation was used to collect data from the respondents from these selected LGAs. Thus, a total of five hundred (500) copies of questionnaire were distributed to 10 randomly selected Local Government Areas out of 27 Local Government Areas of Imo state Nigeria. Out of this number, four hundred and ninety-one representing about 98.2% of the total sample were filled and returned. The questionnaire was designed to elicit information from the respondents on some demographic and economic variables, such as sex, age, level of education, religion, common illness, occupation, traditional affinity and income. The common medical treatment options involved in the study were "modern treatment", "native treatment" and "spiritual healing". The highest educational qualifications were classified into the categories: "NO FSLC", "FSLC", "WAEC/GCE", "ND/NCE", "B.Sc/HND", "M.Sc" and "OTHERS" defined herein.

The communities in the Local Government Areas in this study cut across the three senatorial zones (Orlu, Okigwe and Owerri) in Imo State. Each senatorial zone is a geo-political entity with some common socio demographic characteristics, ranging from socio-cultural identity to economic and geographical similarities. Since the dependent variable (choice of treatment options) is categorical with more than two nominal categories, the appropriate method of data analysis is Multinomial Logistic Regression.

Multinomial logistic regression is a type of regression that focuses on predicting the value of categorical variables with more than two nominal categories based on a set of independent variables which may be continuous and/or categorical.

The linear model for implementing multinomial logistic regression is given by [15] as:

$$f(k,l) = \beta_{0,k} + \beta_{1,k}X_{1,i} + \beta_{2,k}X_{2,i} + ... + \beta_{m,k}X_{m,i} + e_i \qquad i = 1,2,3,...,n \quad l = 1,2,...,m, \quad k = choice \tag{1}$$

Where:

$f(k,l)$ is linear prediction function which predicts the probability of observation X_{li} that has outcome, k.

$\beta_{o,k}$ is the intercept of the model

$\beta_{1,k}$ is the regression coefficient associated with the first explanatory variable and the kth outcome.

$\beta_{2,K}$ is the regression coefficient associated with the second explanatory variable and the kth outcome.

$\beta_{m,k}$ is the regression coefficient associated with the m^{th} explanatory variable and the kth outcome.

X_{li} is the i^{th} observation of the lth independent variable.

e_i is random error component associated with observation i.

With respect to this work,

X_{1i} = No First School Leaving Certificate (NO FSLC)

X_{2i} = First School Leaving Certificate (FSLC)

X_{3i} = West African Examination Certificate/ General Certificate of Education (WAEC/GCE)

X_{4i} = National Diploma/ National Certificate of Education (ND/NCE)

X_{5i} = Bachelor of Science/ Higher National Diploma (BSc/HND)

X_{6i} = Master of Science (MSc)

X_{7i} = Other levels of Education

SPSS (Statistical Package for Social Sciences) Version 23 was used in the analysis of this work.

What follows therefore, are the analyses of the Choices made on the following diseases: Malaria, Mental Disorder and HIV/AIDS respectively.

3.0 Results and Discussion

The following hypothesis were used in studying the three diseases:

H_{0j} : There is no significant effect of Educational Qualification on the Choice of Treatment of $Diseases_j$; $j =$ (Malaria, Mental Disorder and HIV/AIDS)

H_{1j} : There is a significant effect of Educational Qualification on the Choice of Treatment of $Diseases_j$ $j =$ (Malaria, Mental Disorder and HIV/AIDS)

Level of Significance (α) = 0.05

Decision Rule : We shall reject H_{0j} if the p-value is less than the Level of significance (α) 0.05, otherwise, we will not.

3.1 Malaria

Table 1: Model Fitting Information for Malaria

	Model	Model Fitting Criteria	Likelihood Ratio Tests	P-Value
Null	556.123			
Final	75.578	480.546	28	0.000

As shown in Table 1, since the significance level of the test is less than 0.05, we conclude that the Final model is outperforming the Null, implying that there is a significant effect of educational qualification on the choice of treatment of Malaria.

Table 2: Pseudo R-Square for Malaria

Cox and Snell	0.626
Nagelkerke	0.652
McFadden	0.305

In the linear regression model, the coefficient of determination, R^2, summarizes the proportion of variance in the dependent variable associated with the predictor (independent) variables, with larger R^2 values indicating that more of the variation is explained by the model, to a maximum of 1. For regression models with a categorical dependent variable like in this case, it is not possible to compute a single R^2 statistic because of its high correlation with the relative frequency of the dependent variable. This is why there are many R^2 statistics in the logistic regression model. Therefore, R^2 statistic is not very important in the logistic regression model, what matter are the signs and the significance of the regression coefficients. However, some of these methods are used to estimate the coefficient of determination.

- Cox and Snell's R^2 in [16] is based on the log likelihood for the model compared to the log likelihood for a baseline model. However, with categorical outcomes, it has a theoretical maximum value of less than 1, even for a "perfect" model.
- Nagelkerke's R^2 in [17] is an adjusted version of the Cox & Snell *R*-square that adjusts the scale of the statistic to cover the full range from 0 to 1.
- McFadden's R^2 in [18] is another version, based on the log-likelihood kernels for the intercept-only model and the full estimated model.

What constitutes a "good" R^2 value varies between different areas of application. While these statistics can be suggestive on their own, they are most useful when comparing competing models for the same data. The model with the largest R^2 statistic is "best" according to this measure.

Table 3: Parameter Estimates of the Multinomial Logistic Regression Model for Malaria

Respondent's treatment option for Malaria		B	Std. Error	Wald	Df	P-Value	Exp(B)
Pharmacist	[EQ1]	2.197	1.054	4.345	1	.037	9.000
	[EQ2]	2.197	.609	13.035	1	.000	9.000
	[EQ3]	2.398	.522	21.083	1	.000	11.000
	[EQ4]	16.909	1024.906	.000	1	.987	22059060.888
	[EQ5]	2.833	.728	15.162	1	.000	17.000
	[EQ6]	16.894	1761.825	.000	1	.992	21728200.603
	[EQ7]	.000	.000	.	1	.	1.000
Self-Medication	[EQ1]	1.609	1.095	2.159	1	.142	5.000
	[EQ2]	.981	.677	2.099	1	.147	2.667
	[EQ3]	.916	.592	2.399	1	.121	2.500
	[EQ4]	16.263	1024.906	.000	1	.987	11554746.179
	[EQ5]	2.485	.736	11.400	1	.001	12.000
	[EQ6]	16.335	1761.826	.000	1	.993	12416114.630
	[EQ7]	.000	.000	.	1	.	1.000
Prayer house	[EQ1]	.000	1.414	.000	1	1.000	1.000
	[EQ2]	.288	.764	.142	1	.706	1.333
	[EQ3]	.000	.707	.000	1	1.000	1.000
	[EQ4]	15.251	1024.906	.000	1	.988	4201725.883
	[EQ5]	-.693	1.225	.320	1	.571	.500
	[EQ6]	14.948	1761.826	.000	1	.993	3104028.658
	[EQ7]	.000	.000	.	1	.	1.000
Hospital	[EQ1]	2.773	1.031	7.235	1	.007	16.000
	[EQ2]	2.686	.597	20.256	1	.000	14.667
	[EQ3]	3.020	.512	34.795	1	.000	20.500
	[EQ4]	17.602	1024.906	.000	1	.986	44118121.775
	[EQ5]	3.497	.718	23.732	1	.000	33.000
	[EQ6]	17.028	1761.825	.000	1	.992	24832229.261
	[EQ7]	20.042	7953.426	.000	1	.998	506055920.796

Interpretation:

In this section, $f(1,l)$ represents choice of treatment at a Pharmacy, $f(2,l)$ represents Self-medication as choice of treatment, $f(3,l)$ represents choice of treatment at a Prayer House and $f(4,l)$ represents choice of treatment at a Hospital.

From Table 3, the estimated multinomial regression model for Pharmacy is

$$\boldsymbol{f(1,l) = 2.197X_1 + 2.197X_2 + 2.398X_3 + 16.909X_4 + 2.833X_5 + 16.894X_6 + 0.000X_7} \quad (2)$$

Here, 2.197 means that those with "NO FSLC" increases the log odds of obtaining treatment from the Pharmacist by 2.197. This is an indication that if the other six levels of education are kept constant, then for every unit increase in 'NO FSLC', the chances that the respondent will go to treat Malaria at the Pharmacy will increase. The odds $= \exp(2.197) = 9.000$, also implies that those with 'NO FSLC' are $(9.000 - 1.000)*100 = 80\%$ more likely to patronize the Pharmacist. Those with B.Sc/HND with significant parameter coefficient of value of 2.833 are 160% more likely to patronize the Pharmacist for the treatment of Malaria.

Similarly, since the log odds of "FSLC" is 2.197 it implies that those with "FSLC" are $(9.000 - 1.000)*100 = 80\%$ more likely to patronize the Pharmacist.

Also, the estimated Multinomial Regression Model for Self-medication, Prayer House, and Hospital respectively are:

$$\boldsymbol{f(2,l) = 1.09X_1 + 0.981X_2 + \cdots + 0.000X_7} \quad (3)$$

$$\boldsymbol{f(3,l) = 0.000X_1 + 0.288X_2 + \cdots + 0.000X_7} \quad (4)$$

$$\boldsymbol{f(4,l) = 2.773X_1 + 2.686X_2 + \cdots + 20.842X_7} \quad (5)$$

Furthermore, the parameter estimates of Table 3 summarize the effect of each predictor variable on the response variable. Here, any parameter with a p-value that is less than the significant level of 0.05 shows that it has a significant effect in the model.

Consequently, a close look at Pharmacy options and the p-values in Table 3 revealed that those respondents with 'NO FSLC', 'FSLC', 'WAEC/GCE' and 'B.Sc./HND' are significant. That is to say that those respondents that fall under these categories usually go to the pharmacy for treatment of Malaria.

Similarly, in Table 3 under the Self-medication option, those that have 'B.Sc/HND' are significant. This implies that those that fall under these categories will take Self-medication for treatment of Malaria.

Again, for Hospital, those that have 'NO FSLC', 'FSLC', 'WAEC/GCE' and 'B.Sc/HND are significant. This goes on to show that those that fall under these categories will go to the hospital for treatment of Malaria.

Clearly, no educational level chooses Prayer House as a choice of treatment for Malaria.

People with high level of education have the capability of deciding the best option for treatment of Malaria. It is evident that those with B.Sc/HND are the only people with the highest level of education with a significant parameter coefficient value of 3.49 and are 320% more likely to patronize a Hospital for the treatment of Malaria.

3.2 Mental Disorder

Table 4: Model Fitting Information for Mental Disorder

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	d.f	P-Value
Null	618.019			
Final	57.070	560.949	28	0.000

In Table 4, it is evident that the p-value of the test is less than 0.05. Therefore, there is a significant effect of Educational Qualification on the choice of treatment of Mental Disorder.

Table 5: Pseudo R-Square for Mental Disorder

Cox and Snell	0.684
Nagelkerke	0.712
McFadden	0.358

As in Table 2, R^2 statistic is not very important in the Logistic Regression Model, what matter are the signs and the significance of the regression coefficients. However, all these statistics are higher than those of Malaria indicating a better fit.

Table 6: Parameter Estimatesfor the Multinomial Logistic Regression of Mental Disorder

Respondent's treatment option for mental disorder		B	Std. Error	Wald	Df	P-Value	Exp(B)
Native Doctor	[EQ1]	16.820	1497.158	.000	1	.991	20173328.532
	[EQ2]	16.647	921.324	.000	1	.986	16976758.561
	[EQ3]	3.258	1.019	10.222	1	.001	26.000
	[EQ4]	15.663	1028.124	.000	1	.988	6342239.414
	[EQ5]	16.009	773.078	.000	1	.983	8964738.517
	[EQ6]	16.703	2118.453	.000	1	.994	17951381.291
	[EQ7]	.000	.000	.	1	.	1.000
Pharmacist	[EQ1]	.000	2117.301	.000	1	1.000	1.000
	[EQ2]	.000	1302.949	.000	1	1.000	1.000
	[EQ3]	.000	1.414	.000	1	1.000	1.000
	[EQ4]	14.564	1028.125	.000	1	.989	2114079.805
	[EQ5]	.000	1093.297	.000	1	1.000	1.000
	[EQ6]	.000	2995.946	.000	1	1.000	1.000
	[EQ7]	.000	.000	.	1	.	1.000
Prayer house	[EQ1]	16.702	1497.158	.000	1	.991	17931847.584
	[EQ2]	17.341	921.324	.000	1	.985	33953517.123
	[EQ3]	3.932	1.010	15.162	1	.000	51.000
	[EQ4]	17.238	1028.124	.000	1	.987	30654157.165
	[EQ5]	17.326	773.078	.001	1	.982	33468357.131
	[EQ6]	16.926	2118.453	.000	1	.994	22439226.613
	[EQ7]	.000	.000	.	1	.	1.000
Hospital	[EQ1]	17.331	1497.158	.000	1	.991	33622214.219
	[EQ2]	16.870	921.324	.000	1	.985	21220948.202
	[EQ3]	4.143	1.008	16.897	1	.000	63.000
	[EQ4]	17.585	1028.124	.000	1	.986	43338635.992
	[EQ5]	17.344	773.078	.001	1	.982	34066006.365
	[EQ6]	17.715	2118.453	.000	1	.993	49366298.549
	[EQ7]	20.042	7953.426	.000	1	.998	506055920.796

Interpretation:

In this section, $f(1,l)$ represents choice of treatment at the Native Doctor's place; $f(2,l)$ represents choice of treatment at a Pharmacy; $f(3,l)$ represents choice of treatment at a Prayer House and $f(4,l)$ represents choice of treatment at a Hospital.

From Table 6, the estimated Multinomial Regression model for Native Doctor is

$$\boldsymbol{f(1,l) = 16.820X_1 + 16.647X_2 + 3.258X_3 + 15.663X_4 + 16.009X_5 + 16.703X_6 + 0.000X_7} \quad (6)$$

Here, it is only variable X_3 (WAEC/GCE) with p-value of 0.001 (< 0.05) that is significant with corresponding parameter estimate of 3.258. This means that those with "WAEC/GCE" increase the log odds of obtaining treatment from the Native Doctor by 3.258. This is an indication that if the other six levels of education are kept constant, then for every unit increase in 'WAEC/GCE", the chances that the respondent will go to treat Mental Disorder at the Native Doctor's place will increase. The odds $= \exp(3.258) = 16.000$, also implies that those with 'WAEC/GCE' are $(16.000 - 1.000)*100 = 150\%$ more likely to patronize the Native Doctors.

Similarly, the estimated Multinomial Regression Model for Pharmacy, Prayer House and Hospital respectively are:

$$\boldsymbol{f(2,l) = 0.000X_1 + 0.000X_2 + \cdots + 0.000X_7} \quad (7)$$

$$\boldsymbol{f(3,l) = 16.702X_1 + 17.341X_2 + \cdots + 0.000X_7} \quad (8)$$

$$\boldsymbol{f(4,l) = 17.331X_1 + 16.870X_2 + \cdots + 20.042X_7} \quad (9)$$

There is no significant relationship between educational levels and treatment of Mental Disorder in the Pharmacy.

It is only "WAEC/GCE" education level that significantly explains treatment of Mental Disorder in Prayer Houses and Hospitals with parameter estimates of the coefficients of the variable 3.932 and 4.143 respectively. Equally, their odds of 500% and 620% imply that "WAEC/GCE" are 500% and 620% respectively more likely to patronize Prayer House and Hospital as their choices for the treatment of Mental Disorder.

3.3 HIV/AIDS

In this section, $f(1,l)$ represents choice of treatment at the Native Doctor's place, $f(2,l)$ represents choice of treatment in a Prayer House and $f(3,l)$ represents choice of treatment in a Hospital.

Table 7: Model Fitting Information for HIV/AIDS

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	d.f	P-Value
Null	857.531			
Final	40.300	817.231	21	0.000

Since the p-value of the test is less than 0.05, we conclude that the final model is outperforming the Null, implying that there is a significant effect of education qualification on the choice of treatment of HIV/AIDS.

Table 8: Pseudo R-Square for HIV/AIDS

Cox and Snell	0.814
Nagelkerke	0.868
McFadden	0.606

As in Table 2, R^2 statistic is not very important in the logistic regression model, what matter are the signs, value and the significance of the regression coefficients. However, these R^2 values out-perform those of Malaria and Mental Disorder respectively.

Table 9: Parameter Estimatesfor the Multinomial Logistic Regression of HIV/AIDS

Respondent's treatment option for HIV/AIDS		B	Std. Error	Wald	Df	P-Value	Exp(B)
Native Doctor	[EQ1]	17.398	5996.413	.000	1	.998	35957006.477
	[EQ2]	16.274	1.007	261.273	1	.000	11690454.080
	[EQ3]	16.980	.509	1114.549	1	.000	23682711.510
	[EQ4]	-16.222	3331.729	.000	1	.996	9.009E-8
	[EQ5]	1.099	1.155	.905	1	.341	3.000
	[EQ6]	17.485	1.031	287.739	1	.000	39228930.930
	[EQ7]	19.203	10455.400	.000	1	.999	218630743.526
Prayer house	[EQ1]	17.398	5996.413	.000	1	.998	35957006.477
	[EQ2]	18.672	.323	3332.930	1	.000	128594994.879
	[EQ3]	18.729	.228	6723.523	1	.000	136175591.183
	[EQ4]	2.639	1.035	6.500	1	.011	14.000
	[EQ5]	3.219	1.020	9.963	1	.002	25.000
	[EQ6]	18.584	.629	872.458	1	.000	117686792.790
	[EQ7]	.000	.000	.	1	.	1.000
Hospital	[EQ1]	20.765	5996.413	.000	1	.997	1042753187.838
	[EQ2]	20.565	.000	.	1	.	853403147.836
	[EQ3]	20.339	.000	.	1	.	680877955.914
	[EQ4]	4.143	1.008	16.897	1	.000	63.000
	[EQ5]	4.595	1.005	20.904	1	.000	99.000
	[EQ6]	20.258	.000	.	1	.	627662894.881
	[EQ7]	19.203	10455.400	.000	1	.999	218630743.526

Interpretation:

From Table 9, the estimated Multinomial Regression Model for Native Doctor is

$$\boldsymbol{f(1,l) = 17.398X_1 + 16.274X_2 + 16.980X_3 - 16.222X_4 + 1.099X_5 + 17.485X_6 + 19.203X_7} \quad (10)$$

It is only "FSLC", (WAEC/GCE) and "MSc" educational levels that significantly explain treatment of HIV/AIDS in the Native Doctor's place with parameter estimates of the coefficients of the variable 16.274, 16.980 and 17.485 respectively. Their corresponding odds ratios are very high, signifying that "FSLC", (WAEC/GCE) and "MSc" are very likely to choose Native Doctor for treatment of HIV/AIDS. MSc level of education is leading in this group.

Similarly, the estimated Multinomial Regression Model for Prayer House, and Hospital respectively are

$$\boldsymbol{f(2,l) = 17.398X_1 + 18.672X_2 + \cdots + 0.000X_7} \quad (11)$$

$$\boldsymbol{f(3,l) = 20.765X_1 + 20.565X_2 + \cdots + 19.203X_7} \quad (12)$$

From Table 9, all the educational levels of education except "NO FSLC" and "OTHERS" patronize Prayer Houses for treatment of HIV/AIDS with least patronage from "ND/NCE" and "B.Sc/HND".

Also the only significant level of education that explains Hospital as the choice of treatment of HIV/AIDS are "ND/NCE" and "B.Sc/HND" with regression coefficients of 4.143 and 4.595 respectively. Interpreting further using the odds ratios, means that "ND/NCE" and "B.Sc/HND" are 62% and 98% respectively more likely to patronize Hospitals for the treatment of HIV/AIDS.

Table 10: Summary *

SICKNESS	MOST PREFERED EDUATIONAL QUALIFICATION	MEDICAL TREATMENT OPTIONS
MALARIA	B.Sc/HND,WAEC/GCE,FSLC & NO FSLC	PHARMACY
	B.Sc/HND	SELF MEDICATION
	NILL	PRAYER HOUSE
	B.Sc/HND,WAEC/GCE, NO FSLC, FSLC	HOSPITAL
MENTAL DISORDER	WAEC/GCE	NATIVE DOCTOR
	NILL	PHARMACY
	WAEC/GCE	PRAYER HOUSE
	WAEC/GCE	HOSPITAL
HIV/AIDS	MSC, WAEC/GCE, FSLC	NATIVE DOCTOR
	WAEC/GCE, MSc, FSLC & B.Sc/HND	PRAYER HOUSE
	B.Sc/HND, ND/NCE	HOSPITAL

***** The educational levels corresponding to each choice of treatment are written in decreasing order of probability of making the choice.

4.0 Conclusion

Different educational levels use Modern Medical Treatment (Pharmacist and Hospital) as the choice for treatment of Malaria with the dominant group being B.Sc/HND. This further implies that people with higher level of education tends to patronize the Modern Medical Treatment than those with lower level of education in the treatment of Malaria.

Also, it is only the "WAEC/GCE" holders that patronize Native Doctors, Prayer Houses and Hospitals for the treatment of Mental Disorder. This educational level is most likely to patronize Hospitals and the Prayer House than the Native Doctors, given their respective regression coefficients of 3.258 (Native Doctor), 3.932 (Prayer House) and 4.143 (Hospital).

For the treatment of HIV/AIDS, most educational levels patronize Prayer Houses and Native Doctors for treatment of HIV/AIDS. It is only the "B.Sc/HND" and "ND/NCE" that go to Hospital for treatment.

One astonishing finding here, is that the educational level that patronizes the various choices of treatment for Mental Disorder is "WAEC/GCE". It therefore suggests that, it is only this group of educational level that have Mental Disorder.

5.0 Recommendations

1. It is surprising that the only educational level that is linked to the choice of medical treatments for Mental Disorder is the "WAEC/GCE". Therefore, it advised that the government should beam their searchlight on this educational level to find out the cause(s) of this Mental Disorder. Though, given the chronic unemployment rate in Nigeria (38% in the second quarter of 2018) and the low qualification of this level of education, the holders may be greatly disadvantaged in the labour market, see [9].

2. Government should make aware to the public about modern treatments for "HIV/AIDS" in order to discourage the use of non-orthodox methods for treatments of "HIV/AIDS" as this study showed that almost all levels of education patronized Native Doctors and Prayer Houses for the treatment of "HIV/AIDS".

3. Further studies are recommended for the Effect of Sex and Income on the Choice of Medical Treatment Options in Nigeria.

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