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Socio-Cultural and Economic Factors Associated with Home Management and Treatment Seeking Behaviours of Malaria among Parents of Children Treated with Rectal Artesunate in Ogun State, South-Western Nigeria

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ABSTRACT

Home management and treatment seeking behaviours of malaria was assessed among parents of 905 under five years children from 183 rural communities in 8 Local Government Areas (LGAs). Ethical approvals were obtained in addition to interactive sessions with parents and structured questionnaires were administered to the parents. Data obtained were analyzed using SPSS version 20 to assess association with *p*-value of < 0.05. A significant ($p < 0.05$) relationship observed between socio-economic factors and treatment seeking behaviours and preventive measures. There was no significant ($p = 0.614$) difference between symptoms observed in children across the LGAs. There was no significant ($p = 0.061$, $p = 0.059$, $p = 0.071$) relationship between parents demographic characteristics (age, sex and ethnicity) and preventive measures while educational status has a significant ($p = 0.043$) relationship. There was a significant ($p = 0.042$, $p = 0.021$) relationship between occupation and monthly income and preventive measures. Educational status was significantly ($p = 0.013$) related to knowledge on malaria while monthly income was not significantly ($p = 0.201$) related. Also there was a significant ($p = 0.000$ and $p = 0.000$) relationship between both

educational status and monthly income and treatment seeking behaviours and are positively correlated (r = +0.101 and r = +0.136)**.** Effectiveness of home management of malaria (HMM) and treatment seeking behaviours is challenged by the prevailing socio-cultural and economic issues.

Keywords**:** Socio-Cultural and Economic Factors, Home Management of Malaria, Treatment Seeking Behaviours, Ogun State, South-Western Nigeria

1. INTRODUCTION

Malaria is a serious tropical parasitic disease and constitutes a serious public health problem in Nigeria and the most vulnerable groups being children aged zero to five years and pregnant women. It is responsible for 60% outpatient visit to health facilities, 30% childhood deaths, 25% of deaths in children under one year and 11% of maternal death (4,500 die yearly), current estimation showed that population at risk of malaria (2010) is 100% (WHO Report, 2011). The financial loss due to malaria annually is estimated to be over 132 billion Naira for treatment cost, prevention and loss of man-hours. The Nigerian Minister of Health claimed that malaria reduces the country's Gross Domestic Product (GDP) by 1% annually (Nigerian Vanguard, 2012).

Socio-economic development is a fundamental determinant of the global distribution of morbidity and mortality for many health outcomes (Stratton, *et al.*, 2008). The majority of deaths occur among the poorest fifth of the world's population and in sub-Saharan Africa malaria contributes to a loss of 15% of all disability-adjusted life-years. Poor people living in poor quality housing, usually in rural areas, are at increased risk of disease and also have less access to medical facilities and personal protection (WHO, 2001).

Effectiveness of Home Management of Malaria (HMM) programme of WHO/TDR and the formal health system challenged by the prevailing socio-cultural issues pose a major obstacle to achieving the expected outcome of the interventions, Community-based case management of malaria, a strategy formerly known as 'home management of malaria', in which antimalarial treatment is made available close to the home by community health workers has been a cornerstone of the WHO-recommended strategy to improve access to prompt, effective malaria treatment, especially in remote, underserved areas with high malaria transmission. Community-based case management of malaria has been shown to be effective in reducing mortality and morbidity (WHO, 2009; Lemma, *et al.*, 2010).

2. MATERIALS AND METHODS

Study Areas

The study was conducted in Ogun State, Nigeria; a Tropical Rain Forest Zone, lies approximately between Longitude 2°31'W and 4°31' E, and Latitude 6°31 S and 8° N, its bounded in the south partly by the Atlantic Ocean, and sharing common boundaries with Oyo, Osun, Ondo, Lagos States and Republic of Benin (Plate 5).The state is made up of three Senatorial Zones i.e. Ogun Central, Ogun East and Ogun West) and four Geo-Political Zones (GPZs) i.e. Yewa-Awori, Egba, Ijebu and Remo) with five main ethnic groups namely, Egba, Ijebu, Egbado, Awori and Egun. The main occupations are Farming, Textile production (tie

and dye), Fishing, Trading, Civil Servant, Public Servant and Pottering. It has an area of 16,980.55 Square Kilometres (km^2) of the 196,000 km^2 land area of the South-West Zone of the 192,803.07 km^2 of the Southern Nigeria in overall land area of 937,052.16 km^2 of Nigeria. It has a population of 3,751,140, (1,864,907 Males and 1,886,233 Females).

Selection of Study Sites

Grid Systematic Method was employed in selecting sixteen (16) study centres which comprised two Primary Health Centres (PHCs) from each eight Local Government Areas (LGA) namely, Ado-Odo-Ota (ADT), Imeko-Afon (IMA), Ewekoro (EWK), Odeda (ODD),

Ijebu-East (IJE), Ijebu-North (IJN), Odogbolu (ODG) and Remo-North (RMN).

GIS instrument was used to obtained co-ordinates of the PHCs and map was drawn using ArcGIS 9.3 software (Figure 1).

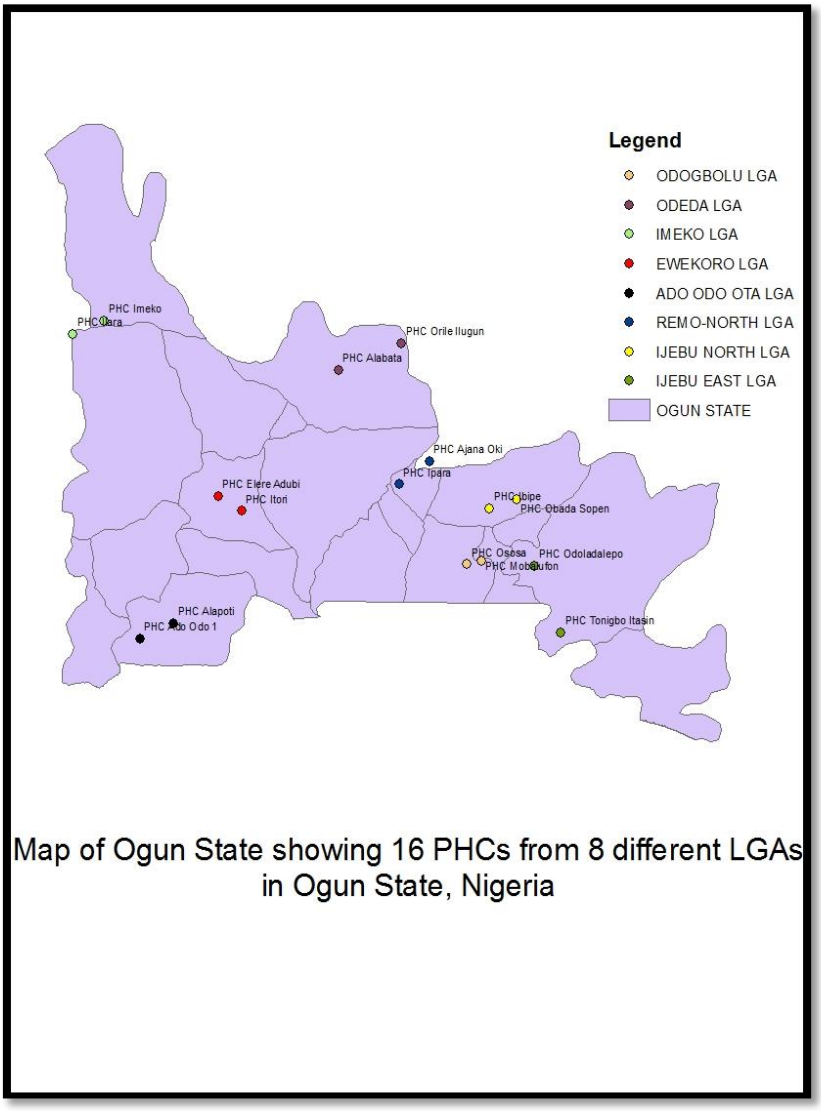

Figure 1. Map of Ogun State Showing the Selected LGAs and their PHCs Used for the Study.

Consent and ethical approvals

Ethical approval was obtained from Ethics Committee of Department of Biological Sciences, and Federal Medical Centre Idi-Aba Abeokuta, Ogun State, Nigeria. Permission for study was obtained from Ogun State Ministry of Health and Local Government Service Commission, Abeokuta Ogun State, Nigeria.

A Certificate of approval was obtained from National Agency for Food and Drug Administration and Control (NAFDAC) for import permission for the Plasmotrim-50/200mg (produced by Acino Pharma Ltd Dornacherstrasse 114/ch-4147 Aesch Switzerland) used for the study and multi-centre clinical trial permission to carry out the research.

Determination of sample size

From the 2014 immunization data obtained from Ogun State Ministry of Health, 905 children were sampled (Table 1). This was calculated using formula by Kothari (2005).

$$N = \frac{Z^2pq}{d^2}$$

Table 1. 2014 Immunization Data of under Five Years Children, Calculated Sample Size, Parents of ≤5 Years Treated, Interviewed Health Workers and Interviewed Patent Medicine Vendors

Local Governments	Selected PHCs	Pop. of Communities	Pop. of <5 Years Children in PHCs	Sample Size	Parents of ≤5 Years Treated
Ado-Odo Ota	Alapoti.	19023	3804	130	74
	Ado-odo 1.	23888	4778		56
Imeko-Afon	Imeko.	18577	3715	110	62
	Ilara.	13033	2607		48
Ewekoro	Itori.	9735	1947	100	50
	Elere-Adubi.	7815	1563		50
Odeda	Ilugun.	16173	3235	110	64
	Alabata.	12889	2578		46
Ijebu-East	Odoladalepo	15696	3139	110	56
	Tonigbo.	8080	1616		54
Ijebu North	Obada.	39273	7855	120	64
	Ibipe.	32500	6500		56

Odogbolu	Ososa.	14868	2974	115	52
	Mobalufon.	25163	5032		63
Remo-North	Ipara	8809	1762	110	59
	Ajana	3856	771		51
Total	**16**	**269378**	**52876**	**905**	**905**

Administration of Questionaires

Structured Questionnaires was administered to the parents on first day of treatment to obtain demographic data, utilization of rectal artesunate and to assess knowledge, attitude and practices, health seeking behaviour and home management of malaria disease and socio-cultural and economic factors associated with malaria disease.

Data Analysis

The questionnaire were entered in MS excel (MS Excel 2007) and analyzed using SPSS version 20 (IBM SPSS Incorporation). Frequencies and percentages were used to compare number of participants associated with a study variable. Averages and 95% confidence interval (CI) were used for summarizing of results. Pearson's Chi-square test, Pearson's R and Spearman correlation (r) were used to test for an association. A *p*-value of < 0.05 was regarded as significant association between the variables.

3. RESULT

Symptoms observed and Preventive Measures of Malaria adopted for Children in across the Study Areas

Analysis of data on the symptoms of malaria observed among the children in the study areas (Figure 2), showed that children with fever (98.2%) were more and least with convultion (38.4%) across the LGAs when compare with other symptoms showed by the children. Respondents showed more of fever (96.0%), vomiting (85.0%), cough (77.0%), and chill/cold/catarrh (73.5%) in Ijebu-East, Odeda, Ado-Odo-Otta and Remo-North LGAs respectively. There was no significant ($p = 0.614$) difference between symptoms observed in children across the LGAs.

Parents Demographic Characteristics, Socio-Cultural and Socio-Economic Factors in Relation to Preventive Measures

In comparing parents demographic characteristics (age and sex) to preventive measures adopted (Figure 3), parents (female) (36.0% and 20.2%) of age group 18-30 years (40.9% and 24.3%) used more of herbs and ITN/LLITN respectively as preventive measures. While parents (female) (20.2% and 8.3%) of age group >50 years also use more of ITN/LLITN (20.8%) and environmental/personal hygiene (25%) respectively as preventive measures.

There was no significant (p = 0.061, p = 0.059) relationship between parents demographic characteristics (age and sex) and preventive measures.

In comparing parents socio-cultural (ethnicity and educational status) factors to preventive measures adopted (Figure 4), illiterate parents (44.7%) who are Yoruba (80.7%) used more of Herbs and least with self medication as preventive measure respectively (42.2% and 4.7%) when compare with other ethnic groups.

There was no significant (p = 0.071) relationship between ethnicity and preventive measures (p>0.05) but there was a significant (p = 0.043) relationship between educational status and preventive measures.

Parents who are farmer with monthly income of 41000-N60000 are more (45.1%), and adopted more of used of Herbs as preventive measure (38.9%). Parents who has tertiary education (33.6%) and have monthly income of >N60000 (23.5%) and commonly used ITN/LLITN as preventive measures (Figure 5).

There was a significant (p = 0.042, p = 0.021) relationship between occupation and monthly income and preventive measures.

Parent Knowledge on Malaria in Relation to Socio-Economic Factors

Majority of the parents are familiar with malaria (92.0 %), admitted that mosquito bite (54.3%) was main cause of malaria disease, and described malaria in children in their communities to be serious (66.5%).

Illiterate (88.6%) and low income parents (<N20000) (92.9%) had mostly infected with malaria during pregnancy. Knowledge on malaria parasites transmission is common among more educated (tertiary) (91.8%) and high income parents (>N60000) (90.6%) (Table 2).

Educational status was significantly (p = 0.013) related to knowledge on malaria while monthly income was not significantly (p = 0.201) related.

Parent Treatment Seeking Behaviours in Relation to Socio-Economic Factors

More educated (tertiary) (93.2%) and high income parents (>N60000) (92.5%) sought help for malaria treatment for their family outside the home. Severity of illness and lack of money were described more by illiterate parents (32.3% and 31.5%) of monthly income <N20000 (45.5% and 38.3%) as reasons for seeking and not seeking treatment at clinics respectively (Table 3).

There was a significant (p = 0.000 and p = 0.000) relationship between both educational status and monthly income and treatment seeking behaviours and are positively correlated (r = +0.101 and r = +0.136)**.**

4. DISCUSSION AND CONCLUSIONS

The symptoms of malaria observed among the children in the study areas showed that children in the rural communities of Ogun State showed corresponding symptoms of uncomplicated (fever and febrile condition) and severe malaria disease, related results on symptoms of children of Ogun State have been reported by Adeneye *et al.* (2013) and Agbeyangi *et al.* (2013), Fatugase *et al.* (2013) in Oyo State, Ekong *et al.* (2013) in Estern Nigeria, Adeyemo *et al.* (2014) in Osun State.

The result on the use of chloroquine (CQ) than other antimalarial drugs was in line with result obtained by Sam-Wobo *et al.* (2010), Olasehinde *et al.* (2010), Adeneye *et al.* (2013), Agbeyangi *et al.* (2013) and Amoran *et al.* (2013) in Ogun State among parents of under five years children, Oyo State (Adesola, 2012) and other parts of Nigeria (Adebayo *et al.*, 2015). However, failure and resistance to the CQ has persisted despite its withdrawal in Nigeria and this has been reported by Omole *et al.* (2010) in Ogun State and Olukosi *et al.* (2014) in Lagos State, and other parts of Nigeria (Adebayo *et al.*, 2015). This may be as result of inadequate educational programmes for rural drugs retailers during the change-over period, which led to low proportions of drug users purchasing adequate doses of the first-line drugs (Artemisinin derivatives) as earlier observed by Ezenduka *et al.* (2014).

The low percent obtained with the use of artesunate derivatives (oral, intramuscular, intravenous and rectal) in the study infers that the use of artesunate drugs which are curently use in combating *falciparum* malaria is low among children of Ogun State and among African children as reported by Karunnajeewa *et al.* (2007) and Agbeyangi *et al.* (2013). This may be due to resistance of *P. falciparum* to artemisinin derivative monotherapy that had been reported in different parts of the world (Ariey *et al.*, 2014; Chotivanich *et al.*, 2014; Ezenduka *et al.*, 2014; WHO, 2014) that resulted in the introduction of ACTs drugs in combacting malaria disease among under five years children and adults, its usage had been reported in Ogun State (Olasehinde *et al.*, 2010; Agbeyangi *et al.*, 2013), other parts of Nigeria (Mukanga *et al.*, 2012; Okwa, 2012; Ezenduka *et al.*, 2014) and Africa (Chanda *et al.*, 2011; Umar *et al.*,2011) as first-line drug.

The obtained result on knowledge of malaria disease revealed that malaria disease is predominant in fhe study communities but they lack adequate knowledge on health seeking behaviours. This was in line with reports by Atulomah and Atulomah (2012), Adeneye *et al.* (2013), Awosan *et al.* (2013), Fatugase *et al.* (2013) and Atulomah *et al.* (2014) on parental KAP on malaria in under five years children of Ogun State, other states of Nigeria (Agomo and Oyibo, 2013; Ajayi *et al.*, 2013; Adebayo *et al.*, 2015), Africa (Kpormegbe and Arholu, 2014) and other part of the world (Salam *et al.*, 2014).

Result obtained on home management of malaria disease practices among consented parents showed home management of malaria disease among consented parents was poor. This report was in line with previous results obtained on parents of under five years children of Ogun State (Adeneye *et al.*, 2013; Fatugase *et al.*, 2013; Atulomah *et al.*, 2014), other state of Nigeria (Adeyemo *et al.*, 2014; Adebayo *et al.*, 2015), Africa (Kpormegbe and Arholu, 2014) and other part of the world (Salam *et al.*, 2014).

The obtained result on health-related preventive behaviours showed that participated parents have seen the impact of environment in malaria parasites infection with need to adopt necessary preventive measures. This result was in line with previous reports on preventive measures and environment factors associated with malaria parasite transmission in the rural and urban communities of Ogun State (Adeneye *et al.*, 2013; Atulomah *et al.*, 2014), other state of Nigeria (Okwa *et al.*, 2013; Adeyemo *et al.*, 2014; Adebayo *et al.*, 2015) and Africa countries (Dhawan *et al.*, 2014).

Parents treatment-seeking behaviours revealed that the parents of under five years children in study communities seek help on malaria treatment mostly in hospital as a result of government intervention in treatment with low cost. The obtained result correspond with results obtained on parental health care-seeking behaviours among parents of under five year

children of Ogun State (Atulomah *et al.*, 2014), other state of Nigeria (Ezedinachi *et al.*, 2015) and other parts of Africa (Kassile *et al.*, 2014; Oyekale, 2015).

The parents knowledge on vectors (mosquitoes) showed a clear indication of knowledge on vectors (mosquitoes) and environmental practices in preventing vectors. Correspond results on preventive measures among people of Ogun State had been reported (Adeneye *et al.*, 2013; Atulomah *et al.*, 2014) and in other parts of Nigeria (Bawa and Auta 2014; Adebayo *et al.*, 2015) and Africa (Dhawan *et al.*, 2014; Sikala *et al.*, 2014).

Parent perception on the use of ITN/LLITN for preventing mosquitoes revealed that all participated parents have heard, own and use it at home for their. The obtained result is an indication of awareness on the use of ITN/LLITN. The correspond results of the use, ownership and andvantage of ITN/LLITN among people of Ogun State had been reported previously (Atulomah *et al.*, 2014; Runsewe-Abiodun and Adekunle, 2014) and in other parts of Nigeria (Awosan *et al.*, 2013; Adeyemo *et al.*, 2014; Adebayo *et al.*, 2015), Africa (Desrocher *et al.*, 2014) and other parts of the world (Burgert *et al.*, 2014; Noriko *et al.*, 2014; Sikala *et al.*, 2014).

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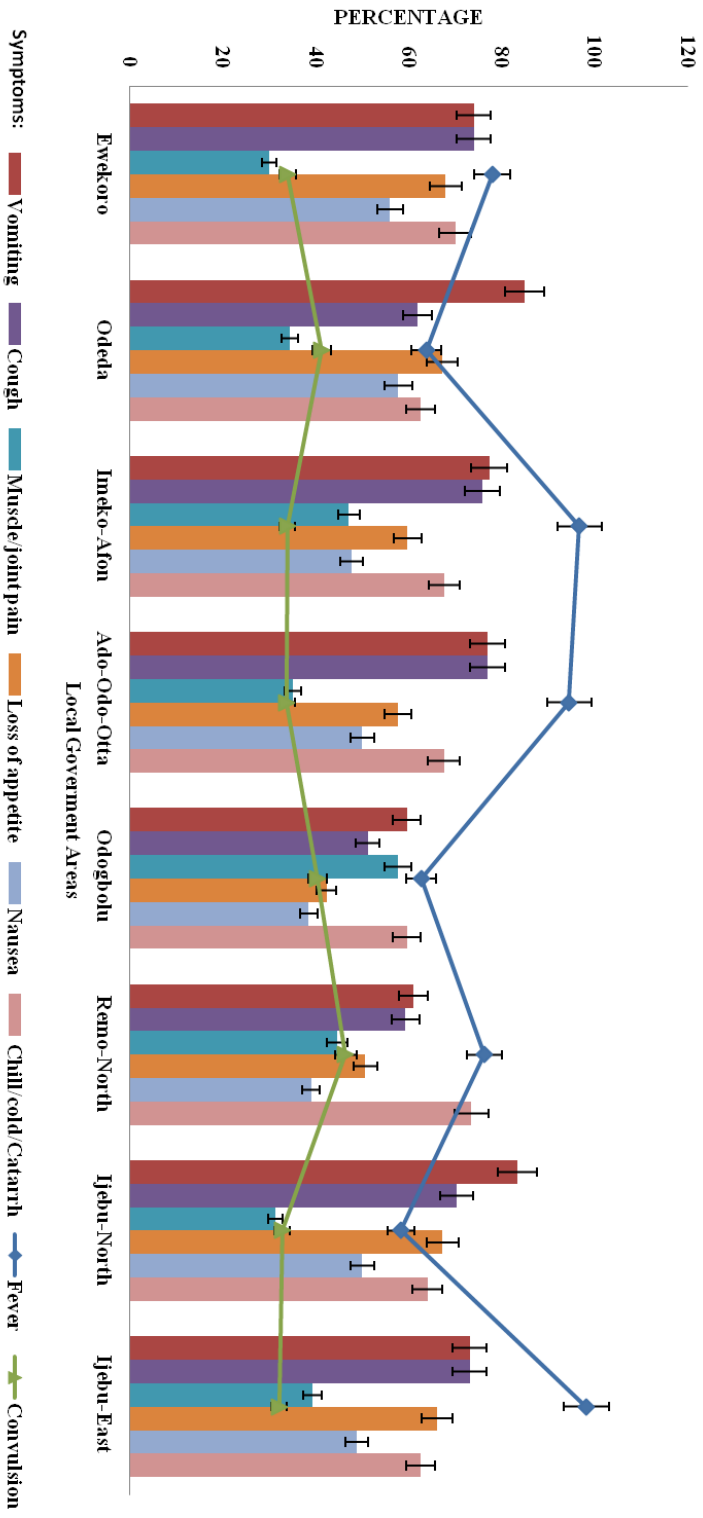

Figure 2. Symptoms of Malaria observed among Children in the Study Areas

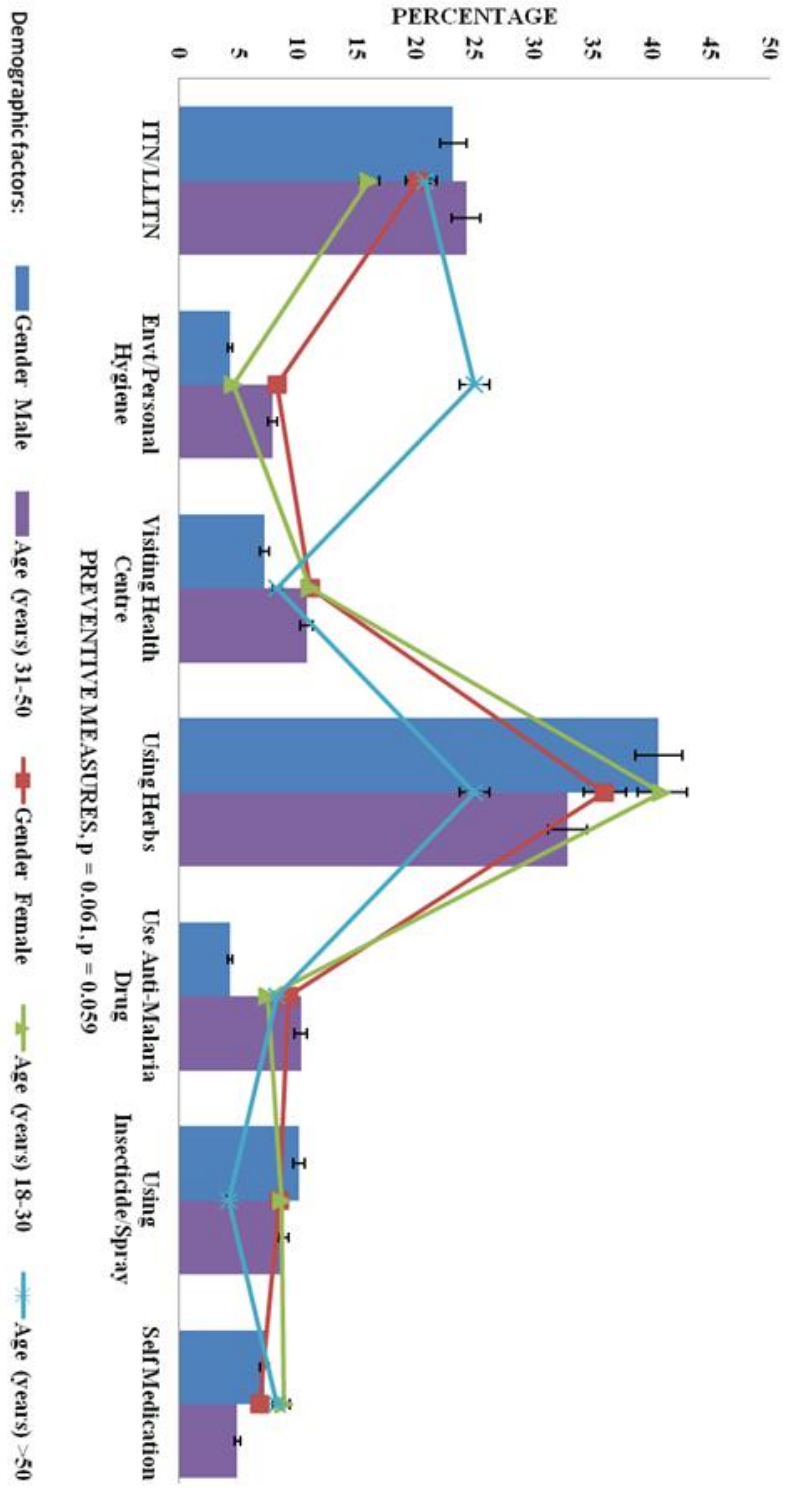

Figure 3: Parents Demographic Characteristics (Sex and Age) in Relation to preventive measures

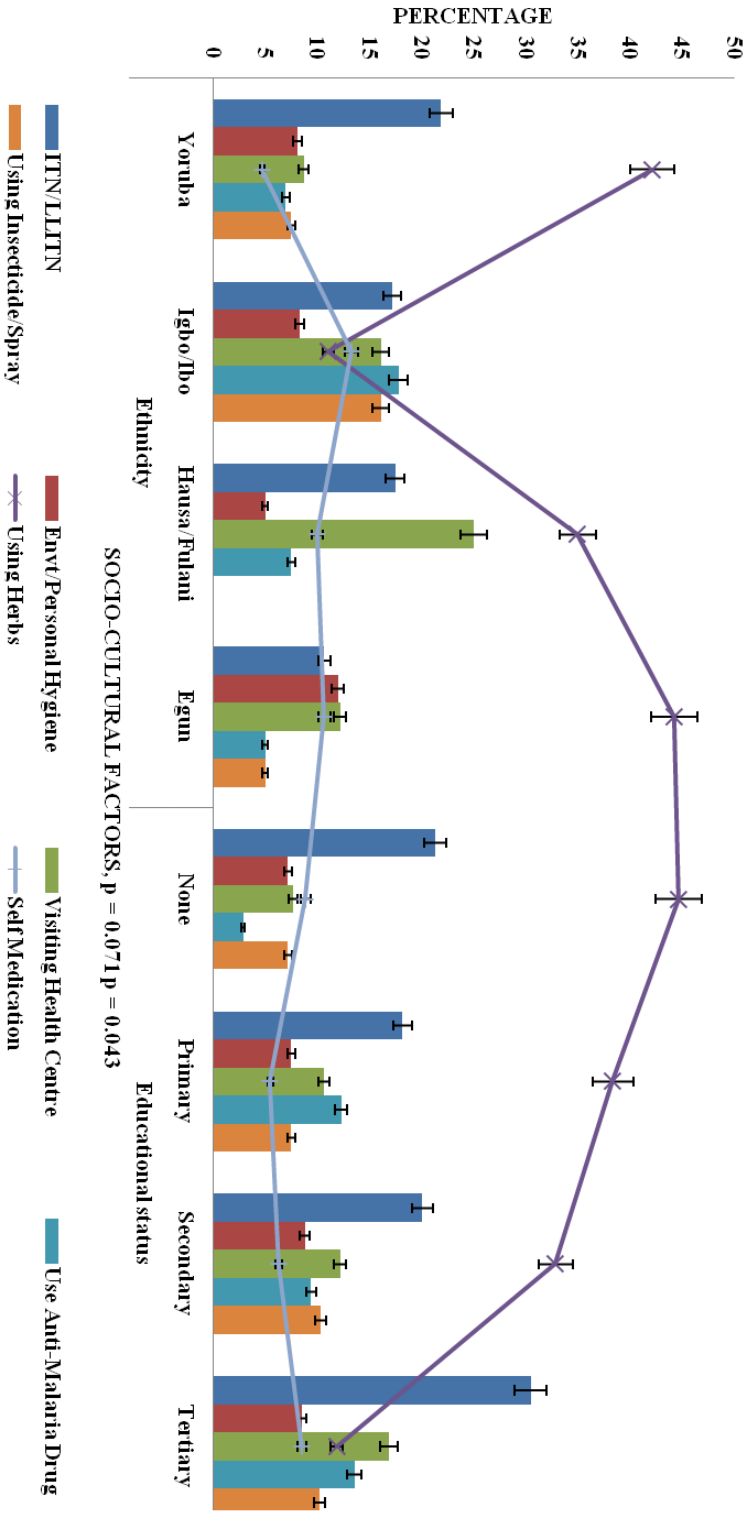

Figure 4. Parents Socio-Cultural Factors in Relation to Preventive Measures

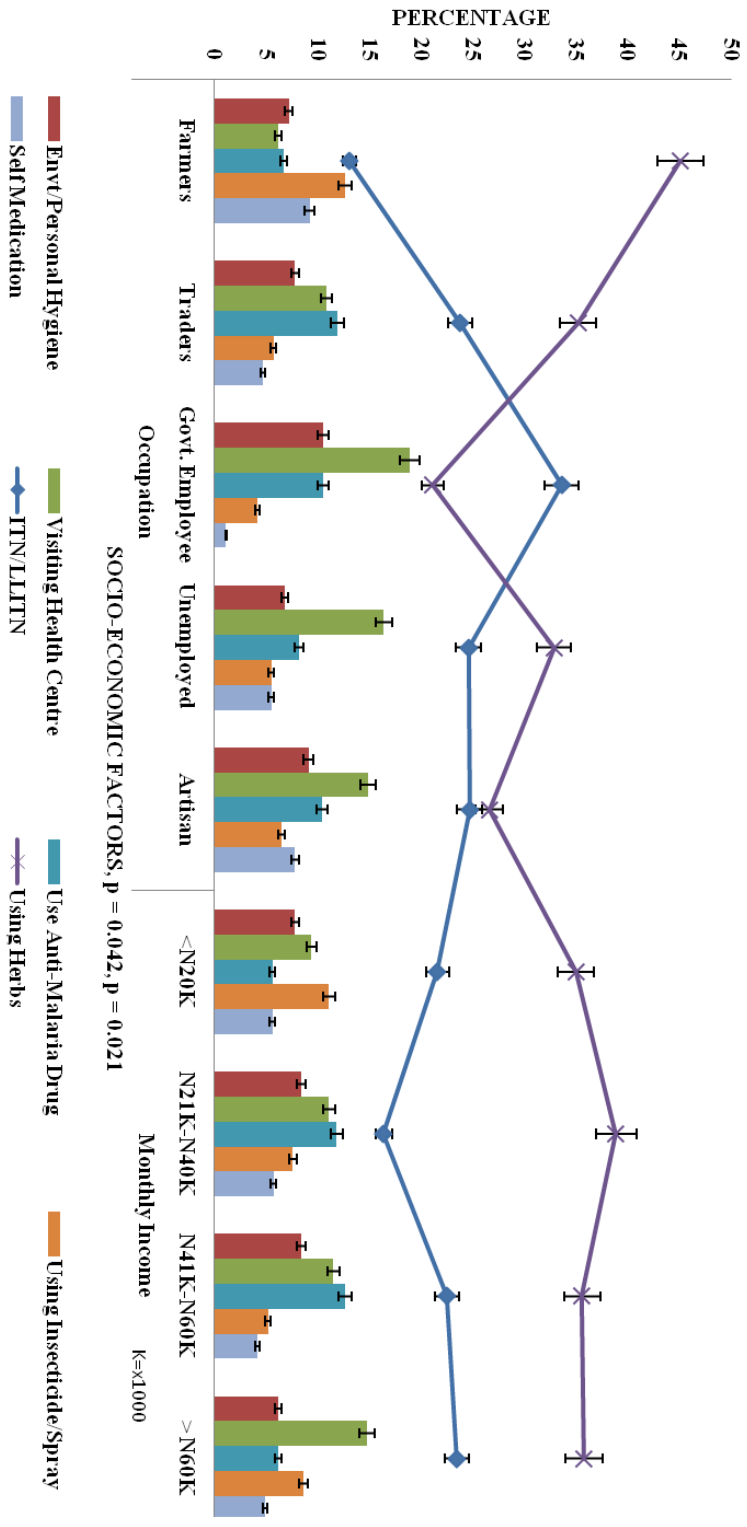

Figure 5. Parents Socio-Economic Factors in Relation to Preventive Measures

Table 2. Parents Knowledge on Malaria in Relation to Socio-Economic Factors

KNOWLEDGE ON MALARIA		SOCIO-ECONOMIC FACTORS							
		Parents Educational status (%), $p = 0.013$				Parents Monthly Income (K=X1000) (%), $p = 0.201$			
		None N=235	Primary N=292	Secondary N=319	Tertiary N=59	<N20K N=371	N21K-N40K N=262	N41K-N60K N=191	> N60K N=81
Are you familiar with the term 'Malaria' in children?	Yes	94.9	98.8	88.1	98.3	92.9	89.7	94.2	90.1
	No	5.1	7.2	11.9	1.7	7.1	10.3	5.8	9.9
What do you think cause(s) malaria?									
Walking/playing in sun/rain		20.4	17.5	13.1	5.1	18.3	17.3	16.8	14.8
Stress		6.4	7.5	3.1	0	19.1	8.8	8.9	2.5
Bite from infected mosquitoes		59.1	54.1	64.6	69.5	40.2	44.2	46.1	56.8
Dirty surrounding		14.1	21.9	19.1	16.9	22.4	24.8	28.3	25.9
How would you describe malaria in children in this community?									
Serious		67.7	70.2	69.9	66.1	64.7	69.1	57.3	66.7
Not serious		32.3	27.8	30.1	33.9	35.3	30.9	42.7	33.3
Have you been infected with malaria during pregnancy (if woman)?	Yes	86.8	88.0	89.3	61.0	92.9	91.9	85.0	58.0
	No	13.2	12.0	10.7	39.0	7.1	8.1	15.0	42.0
Did you think malaria can be transmitted?	Yes	69.4	72.6	80.1	91.8	82.5	72.9	75.3	90.6
	No	30.6	25.4	19.9	68.2	17.5	27.1	24.7	9.4

Table 3. Parents Treatment Seeking Behaviours in Relation to Socio-Economic Factors

TREATMENT SEEKING BEHAVIOURS		SOCIO-ECONOMIC							
		Educational status of the parents (%), $p = 0.000$				Parents Monthly Income (K=X1000) (%), $p = 0.000$			
		None N=235	Primary N=292	Secondary N=319	Tertiary N=59	<N20K N=371	N21K-N40K N=262	N41K-N60K N=191	> N 60K N=81
Did you seek help for malaria treatment outside the home for your family?	Yes	69.4	77.7	82.1	93.2	81.7	72.9	72.3	92.5
	No	30.6	22.3	17.9	6.8	18.3	27.1	27.7	7.4
How many days after the episode of malaria did you take your child to the clinic/hospital?									
Same day		30.2	22.2	35.4	35.6	34.6	27.5	31.9	23.5
Second day		47.7	44.9	38.9	39.8	40.7	43.5	26.7	22.2
>2 days		33.1	32.9	30.7	35.6	24.7	29.0	41.4	54.3
What are the main reasons for seeking treatment at the hospital/clinic?									
Low cost		30.6	26.4	21.6	20.5	23.7	25.6	26.7	17.3
Severity of illness		32.3	31.5	31.2	8.5	31.5	28.6	32.9	14.8
Hospital effective treatment		12.8	17.6	19.6	40.7	8.4	17.6	14.1	24.7
Child is very young		17.9	19.8	14.7	18.6	19.1	13.4	16.7	32.1
Recommended from others		6.4	8.6	12.9	11.7	17.3	15.6	9.4	4.9
What are the main reasons for not seeking treatment at the hospital/clinic?									
Disease uncomplicated		17.5	17.5	20.6	15.3	20.7	12.6	24.6	34.5
Lack of money		45.5	43.5	36.1	22.0	38.3	41.6	33.5	19.7
Home treatment is sufficient		11.0	14.7	12.6	11.7	16.9	21.4	14.1	16.0
Waiting hours		26.	25.3	30.7	34.0	23.9	24.4	27.7	29.6
Where did you seek treatment when any member of your household has malaria?									
Patient medicine vendors/hawkers		32.3	28.1	21.6	28.8	23.1	27.5	27.7	38.3
Government Hospital		19.2	16.8	25.4	37.3	17.5	17.6	15.2	20.9
Private Clinic		28.9	35.6	31.7	20.3	29.9	29.8	31.9	24.6
Local healer		13.2	10.6	11.6	8.5	21.3	16.8	15.7	12.3
Religious leader		6.4	8.9	9.7	5.1	8.1	8.4	9.4	3.7