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Family variables and its influence on malaria prevention practices among households in Ife east local government area, Osun state, Nigeria

***Sonibare O.O.[1], Esimai O.A.[2] and Olowookere S.A.[2]**

Abstract

Background: An understanding of the family variables that influence malaria prevention practices (MPPs) is valuable in endemic communities with implications for family health. The study aim was to determine the family variables influencing MPPs among households in Ife East Local Government Area of Osun state.

Methods: This was a descriptive cross-sectional survey that used a pre-tested interviewer-administered questionnaire. Chi-square test was used to determine the relationship between family variables and MPPs. Binary logistic regression was used to identify family variables influencing MPPs.

Results: Among 272 households, 52.6% had good MPPs. Family variables influencing good MPPs include monogamous family (OR = 2.02, 95% CI = 1.10 – 3.71, p = 0.023), less than 5 family size (OR = 2.42, 95% CI = 1.39 – 4.22, p = 0.002) and primary level of education (OR = 5.78, 95% CI = 2.01 – 16.61, p = 0.001).

Conclusion: Among the households, use of MPPs was fair and it was significantly influenced by some family variables. These findings highlight the need to take cognizance of family variables in the design of programs for malaria intervention.

Key words: Family variables, Malaria prevention practices, Households, Nigeria

***Corresponding author**
Sonibare O.O.
Email: wonuola23@yahoo.co.uk; Omowonuola.Sonibare@uniosun.edu.ng

[1]Department of Family Medicine, College of Health Sciences, Osun State University, Osogbo, Nigeria
[2]Department of Community Health, College of Health Sciences, Obafemi Awolowo University, Ile-Ife, Nigeria.

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Variables familiales et son influence sur les pratiques de prévention du paludisme parmi les ménages dans la zone de gouvernement local de l'Ife est, état d'Osun, Nigéria

***Sonibare O.O.[1], Esimai O.A.[2] and Olowookere S.A.[2]**

Résumé

Contexte de l'étude : Les destinataires importants de l'information sanitaire sont les familles qui motivent leurs membres sur des pratiques favorables à la santé telles que la prévention du paludisme. Une compréhension des variables familiales qui influencent les pratiques de prévention du paludisme est précieuse dans les communautés où le paludisme est endémique, avec des implications pour la santé familiale. Le but de l'étude était de déterminer les variables familiales influençant les pratiques de prévention du paludisme dans les ménages de la zone de gouvernement local d'Ife East, dans l'État d'Osun, au Nigéria.

Méthode de l'étude : Il s'agissait d'une enquête transversale descriptive qui utilisait une méthode quantitative de collecte de données. La technique d'échantillonnage à plusieurs degrés a été utilisée pour sélectionner 282 ménages dans la zone d'étude. Un questionnaire pré-test administré par un enquêteur a été utilisé pour collecter des informations sur les variables sociodémographiques familiales et les pratiques de prévention du paludisme dans les ménages. Le test du chi carré a été utilisé pour déterminer la relation entre les variables familiales et les pratiques de prévention du paludisme. La régression logistique binaire a été utilisée pour identifier les variables familiales influençant les pratiques de prévention du paludisme.

Résultat de l'étude : Parmi les ménages, 52,6% avaient de bonnes pratiques de prévention du paludisme. Les variables familiales influençant les bonnes pratiques de prévention du paludisme comprennent la famille monogame (OR = 2,02, IC à 95 % = 1,10 - 3,71, p = 0,023), la taille de la famille inférieure à 5 (OR = 2,42, IC à 95 % = 1,39 - 4,22, p = 0,002) et le niveau d'éducation primaire (OR = 5,78, IC à 95 % = 2,01 - 16,61, p = 0,001).

Conclusion : L'étude a montré que l'utilisation des pratiques de prévention du paludisme était légèrement bonne. Plus précisément, son utilisation était significativement influencée par certaines variables familiales. Ces résultats soulignent la nécessité de tenir compte des variables familiales dans la conception des programmes d'intervention contre le paludisme.

Mots-clés : Variables familiales, pratiques de prévention du paludisme, ménages, Nigéria

***Corresponding author**
Sonibare O.O.
Email: wonuola23@yahoo.co.uk; Omowonuola.Sonibare@uniosun.edu.ng

[1]Department of Family Medicine, College of Health Sciences, Osun State University, Osogbo, Nigeria
[2]Department of Community Health, College of Health Sciences, Obafemi Awolowo University, Ile-Ife, Nigeria.

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INTRODUCTION

In Nigeria, malaria is a household name known to contribute largely to economic burden (1)thus, prevention practices have been put in place by families to curtail its menace. According to the Center for Disease Control and Prevention, 3.3 billion people worldwide reside in areas that place them at risk of malaria transmission (2). Africa bears over 80% of the global malaria burden, and Nigeria accounts for about 29% of this burden.(3) Malaria is endemic in Nigeria and remains a major public health problem with nearly everybody (97% of the population) being at risk of the infection. Malaria is a burden on both the financial and human resources of Nigeria. It has continued to be a serious public health problem in sub-Saharan Africa (4) and has affected the health and wealth of nations and individuals.(5) The cost of malaria can be estimated in lives lost, in time spent ill with fever, and in economic terms.(6) Assessing its economic impacts on household shows that families bear a substantial amount of direct cash expenses which can be classified into two broad categories, household expenditures on treatment (direct medical and non-medical costs). Direct medical costs are the cash payments for doctor's fees, laboratory tests and drugs. Direct non-medical costs include payments for food, lodging, transportation and miscellaneous expenses associated with seeking and obtaining medical care.

Households' indirect costs for morbidity and mortality of malaria shows that households incur costs in terms of income or wage lost, school days missed and reduced productivity and output due to morbidity of malaria.(7) Indirect cost due to malaria illness may be lower in settings where young children are affected by the disease than in settings where both adults and children are equally vulnerable to the disease.(8) Malaria also imposes significant economic cost to households by causing the permanent loss of productive labour time through premature death. Life lost to the disease through premature death is also an indirect cost to households and society in general.(6,7)

Premature death of an economically active workforce destroys permanently the potential output of households. At the same time, contribution to the Gross Domestic Product (GDP) is lost to the society. There is another type of cost of the illness, for example, cost of pain, suffering, and loss of leisure time, that cannot be easily quantified monetarily and is known as intangible cost.(9) It has been reported that households suffer greatly from the burden of malaria despite the fact that it is preventable.(8,10) The family which is the most basic social unit directs the health status and the socio-medical needs of its family members.(11) Thus, malaria control efforts can no longer afford to overlook the multidimensional human context that create and supports varying notions of malaria and its prevention. Families constitute important human and social institutional resources for which the utilization of malaria prevention practices should play a significant role in promoting their health.

Furthermore, reliable and comparable analysis of family socio-demographic factors that influence the utilization of malaria prevention practices is essential when developing guidelines and recommendations for more effective malaria prevention in many malaria endemic areas of the world including Nigeria. As a result of this, the researchers set out to ascertain family socio-demographic variables that influence malaria prevention practices among households in Ife East Local Government Area of Osun state. The findings of this study will help to take cognizance of family variables in the designing of programs for malaria intervention.

MATERIALS AND METHODS

Study Location

The study was a descriptive cross-sectional survey conducted in Ife East Local Government Area (LGA) of Osun state (Figure 1). Ife East LGA is one of the LGA in the state which is predominantly rural and has its headquarters situated in Oke-Ogbo located between longitude 4º 32'E and 4º 40'E and latitude 7º 15'N and 7º 35'N. The climate of the area is typically tropical, with a characteristic dry season of about five months (November - March) and a wet season of about seven months (April – October). The vegetation of the area is tropical rainforest, characterized by large and tall trees. It has an area of about 172km^2 (66 sq ml) with a population of 188,027 according to the 2006 National Census. It is made up of ten wards namely; Ilode I, Ilode II, Moore, Okerewe I, Okerewe II, Okerewe III, Yekemi, Modakeke I, Modakeke II and Modakeke III. The inhabitants are predominantly Yoruba speaking people of the Southwest with a mixture of people from different ethnic groups in Nigeria. Farming is the main occupation of the people but some are traders, transport workers, artisans and civil servants.

Study Design
The study was a descriptive cross-sectional survey which employed the quantitative method of data collection.

Study Population
The study population are married men and women resident in households in the LGA. Those included in the study were married men and women (aged $\geq$18 years) with children in the households while those with critical illness were excluded because it could prevent them from adequately responding to the questionnaire.

Sample Size Determination
The minimum sample size was calculated using the Leslie Kish formula cited by Araoye,(12) for calculating single proportion, $n = Z^2pq/d^2$ where, n= minimum sample size; Z= standard normal deviate set at 1.96 which corresponds to the 95% confidence level; d= degree of accuracy desired (set confidence interval) at 0.05. The prevalence of malaria prevention practice (ITN/LLIN) among households was 21.1% in a previous study carried out in Nigeria's geopolitical zones.(13).The minimum sample size was calculated as 256. With 10% non-response rate, the total number of households to be recruited was 282.

Sampling Technique
A multi-stage sampling technique was used in the selection of married men and women in the households. At the first stage, by simple random sampling technique (balloting), three wards were selected from the 10 wards in the LGA. At the second stage, 20 streets were selected from the lists of streets obtained from the three wards using simple random sampling technique (balloting). At the third stage, from the list of houses (house numbering) on each street, 15 houses were selected per street using simple random sampling technique (balloting). In the fourth stage, in each selected house, households with eligible consenting married man or woman with children were selected as the respondents. In a selected house where there are more than one household with eligible respondents, simple random sampling technique (balloting) was used to select the eligible respondents.

Data Collection Tools
Detailed enquiries was made about:
a.) Family socio-demographic variables such as spousal age, occupation, educational status with family structure and dynamics such as type of marital union, position of respondent in the household, family size and living together of spouses.
b.) Household malaria prevention practices.
The family socio-demographic variables were classified as follows: age group was categorized as l8 to 34 years, 35 to 54 years and 55 years and above for bivariate analysis; family size was categorized as less than 5 and five and above; family structure as monogamy and polygamy; and educational status as no formal education, primary, secondary and tertiary while occupational status was categorized as civil servant, trader and artisan.
The malaria prevention practices of households were obtained from the questionnaire and observational checklist. The practices included use of mosquito nets (ITN/LLIN), insecticide spray, coil, repellent, traditional herbs, drugs (IPTp) and closing of windows before nightfall. Practices observed include, presence of mosquito proofing on windows and doors, presence of mosquito nets (ITN/LLIN) in the households, presence of covered drains, absence of stagnant water or ponds in the compounds, absence of containers that could potentially hold water for mosquito breeding and presence of low vegetation within 5 meters of the house. Each of the questions had two possible responses: “yes” and “no”. Overall malaria prevention practices score was determined for each respondent by summing up the scores and the mean score was used to categorize into good or poor practices.
The questionnaire was pre-tested among 29 married men and women in Ife Central Local Government Area of Osun state to check for validity. Finding from the pre-test was used in addressing some ambiguous questions. The questionnaire was translated to Yoruba and back translated into English to ensure concurrence.
The authors operationally defined a family as a group of people related either by blood, marriage, or adoption. A household is a person or a group of persons, related or unrelated, who live together and have common cooking and eating arrangements while malaria prevention practices are routine activities and actions of individuals or groups on malaria prevention. It includes the use of insecticide-treated net, indoor residual spraying, insecticide spray, clearing of vegetation, installation of window and door nets, and elimination of stagnant water.

Data Analysis
Data was analyzed using the IBM/Statistical Package for Social Sciences (SPSS) version

20.0. Three levels of statistical analyses were employed; univariate analysis was used to determine frequencies and proportions of family socio-demographic factors. At bivariate level, chi-square test was used to determine association between family variables and malaria prevention practices. Multivariate analysis using binary logistic regression was used to identify family variables influencing malaria prevention practices. Criteria for inclusion of variables in the logistic regression model was a p-value <0.2 in the bivariate. The level of statistical significance was taken to be p<0.05.

Ethical Consideration

The protocol for the study was approved by the Ethics and Research Committee of Institute of Public Health, Obafemi Awolowo University, Ile-Ife. An ethical clearance certificate was issued with protocol number: IPH/OAU/12/1529. Written informed consent was sought from each respondent after adequate explanation about the purpose of the study had been given and the confidentiality of the information provided was reassured.

RESULTS

Family socio-demographic variables of the study respondents

Table 1 shows the family socio-demographic variables of respondents in the households. A total of 282 questionnaires were administered, 272 had complete data and were analyzed giving a response rate of 96.5%. Among the households, 68% were in a monogamous family setting, 55.9% were wives, 90.4% were living together with their spouses and 68.0% had a family size of five and above. The age group of the spouses ranged from 21 years to 76 years with a mean age (SD) of 41.81±10.31 years. Sixty-three percent of the spouses were within age group 35 – 54 years, 49% had secondary level of education and 54.0% of them were artisans.

Categorization of malaria prevention practices in the households

Figure 2 shows the categorization of malaria prevention practices in the households. Fifty-three percent had good malaria prevention practices while 47.4% had poor malaria prevention practices.

Relationship between family variables and malaria prevention practices

Table 2 shows the relationship between family variables and malaria prevention practices. A significantly higher proportion of respondents (67.6%) in monogamous family had good malaria prevention practices compared with polygamous (37.9%) family (χ^2 = 4.625, p = 0.032). A significantly higher proportion of respondents (72.4%) with less than 5 family size had good malaria prevention practices compared with a family size of 5 and above (32.4%) (χ^2 = 12.794, p = 0.001). Similarly, a significantly higher proportion of respondents (85.4%) with primary level of education had good malaria prevention practices compared with secondary (47.8%), tertiary (45.9%) and no formal education (43.5%) (χ^2 = 20.994, p = 0.001).

Logistic regression of the family variables

Table 3 shows the logistic regression analysis of family variables influencing malaria prevention practices. Respondents that are monogamous are two times more likely to have good malaria prevention practices compared with those of polygamous family (OR = 2.02, CI = 1.10 – 3.71, p = 0.023). Similarly, respondents with less than 5 family size are 2 times more likely to have good malaria prevention practices compared with those with 5 family size and above (OR = 2.42, CI = 1.39 – 4.22, p = 0.002). Similarly, respondents with primary level of education are 5 times more likely to have good malaria prevention practices compared with those with tertiary level of education (OR = 5.78, CI = 2.01 – 16.61, p = 0.001).

DISCUSSION

This study has provided insight into family variables and how it influences malaria prevention practices (MPPs) in households. Among the households, the use of malaria prevention was fair with 52.6% having good malaria prevention practices while 47.4% had poor malaria prevention practices and this study showed that three family variables which are family structure, family size and the spousal level of education have significant positive influence on MPPs in the households. This study observed that household monogamous families are two times more likely to have good malaria prevention practices than polygamous families. This finding is similar to report of a study conducted in Eastern Nigeria where all the respondents who used ITNs for under-five children in their study were from monogamous family.(14) This was viewed as probably due to a functional family communication between spouses in a monogamous family. The significant association found in this study could be

explained by facilitation of good and healthy family support in monogamous family which may foster utilization of family health interventions. This study established that households with less than five family size are two times more likely to have good MPPs than those with family size of five and above and this finding is consistent with that found in a study done in Eastern Nigeria where a higher use of ITN as a MPP among under-fives in households occurred with smaller family size.(14) Similarly, in a study carried out among women in Nigeria, it was revealed that women from households with less than five members were more likely to use ITN as a MPP than those with five or more household members.(15) Other studies have also observed that the number of household members is a factor influencing use of ITN as a MPP.(16,17) The above findings suggest that larger family sizes are probably associated with stress and weak family support for MPPs.(18,19) In addition, this study found that spouses with primary level of education are five times more likely to have good MPPs in their households than those with tertiary level of education. Contrary to this finding, some other research reported higher probability of MPP use by highly educated individuals compared to poorly educated ones.(20-24) Similarly, a study conducted in Eastern Nigeria observed that educational status influenced the use of ITNs as a MPP among under-fives in households.(14) Also, spousal education is noted to be associated with greater commitment to family health practices and care,(14) and since information is the first step for practice, households with educated individuals are more likely to practice malaria prevention than uneducated ones. The difference in the findings of this study compared to others can largely be explained by the possibility of an awareness of increased vulnerability to malaria infection in the poorly educated compared to the highly educated thus enhancing use of MPPs.

Strength and Limitation of Study

The study was conducted in a malaria endemic area where malaria had public health importance using raw data. A self-reported data may reflect a desirability of responses rather than actual practices and this may subject the study to response and recall bias. This was minimized by using an interviewer-administered data collection method. The generalizability of the findings is limited as the results may be in the context of the culture and environment of the study area however, the study could serve as a guide for planning and implementing malaria intervention in settings with similar demographics.

CONCLUSION

This study concluded that majority of the households had good malaria prevention practices. The family variables influencing good malaria prevention practices include monogamous family, family size less than five and primary level of education.

RECOMMENDATIONS

The following recommendations are suggested based on the findings of this study:

a) There is a need to take cognizance of family-related factors in the designing of programs for malaria intervention.

b) There is a need for malaria prevention efforts to focus on households with polygamous family, large family size and spouses with high level of education.

List of abbreviations

GDP: Gross Domestic Product; IPTp: Intermittent Preventive Treatment during pregnancy; ITNs: Insecticide Treated Nets; LGA: Local Government Area; LLINs: Long-Lasting Insecticidal Nets/Long Lasting Insecticide Treated Nets; MPPs; Malaria Prevention Practices; SPSS: Statistical Product and Service Solution.

Conflict of interest: None declared.

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Table 1: Family Socio-Demographic Variables of Respondents

Family Variable	Frequency (n=272)	Percentage (%)
Family Structure		
Monogamy	185	68.0
Polygamy	87	32.0
Position of Respondent in the Household		
Husband	120	44.1
Wife	152	55.9
Spouses Living Together		
Yes	246	90.4
No	26	9.6
Family Size		
< 5	87	32.0
= 5	185	68.0
Age Group of Spouses (Years)		
18-34	65	23.9
35-54	171	62.9
=55	36	13.2
Level of Education of Spouses		
No formal education	23	8.5
Primary	41	15.0
Secondary	134	49.3
Tertiary	74	27.2
Occupational Status of Spouses		
Civil servant	53	19.5
Trader	72	26.5
Artisan	147	54.0

Table 2: Family Variables influencing Malaria Prevention Practices

Family Variable	Malaria Prevention Practices			χ^2	df	p-value
	Poor n (%)	Good n (%)	Total			
Family Structure						
Monogamy	60 (32.4)	125 (67.6)	185 (100)	4.625	1	0.032*
Polygamy	54 (62.1)	33 (37.9)	87 (100)			
Position of Respondents in the Household						
Husband	61 (50.8)	59 (49.2)	120 (100)	1.000	1	0.317
Wife	68 (44.7)	84 (55.3)	152 (100)			
Spouses Living Together						
Yes	118 (48.0)	128 (52.0)	246 (100)	0.302	1	0.583
No	11 (42.3)	15 (57.7)	26 (100)			
Family Size						
< 5	24 (27.6)	63 (72.4)	87 (100)	12.794	1	0.001*
= 5	125 (67.6)	60 (32.4)	185 (100)			
Age Group of Spouses (Years)						
18 – 34	32 (49.2)	32 (50.8)	65 (100)			
35 – 54	81 (47.4)	90 (52.6)	171 (100)	0.213	2	0.899
= 55	16 (44.4)	20 (55.6)	36 (100)			
Level of Education of Spouses						
No Formal Education	13 (56.5)	10 (43.5)	23 (100)			
Primary	6 (14.6)	35 (85.4)	41 (100)	20.994	3	0.001*
Secondary	70 (52.2)	64 (47.8)	134 (100)			
Tertiary	40 (54.1)	34 (45.9)	74 (100)			
Occupational Status of Spouses						
Civil Servant	32 (60.4)	21 (39.6)	53 (100)			
Trader	32 (44.4)	40 (55.6)	72 (100)	4.429	2	0.109
Artisan	65 (44.2)	82 (55.8)	147 (100)			

*significant

Table 3: Logistic Regression Analysis on Family Variable Influencing Malaria Prevention Practices

Family Variable	Adjusted OR	95% CI	p-value
Family Structure			
Monogamy	2.02	1.10 – 3.71	0.023*
Polygamy (ref)	1.00		
Family Size			
< 5	2.42	1.39 – 4.22	0.002*
= 5 (ref)	1.00		
Level of Education of Spouses			
No Formal Education	0.61	0.21 – 1.81	0.372
Primary	5.78	2.01 – 16.61	0.001*
Secondary	1.07	0.56 – 2.03	0.841
Tertiary (ref)	1.00		

*significant

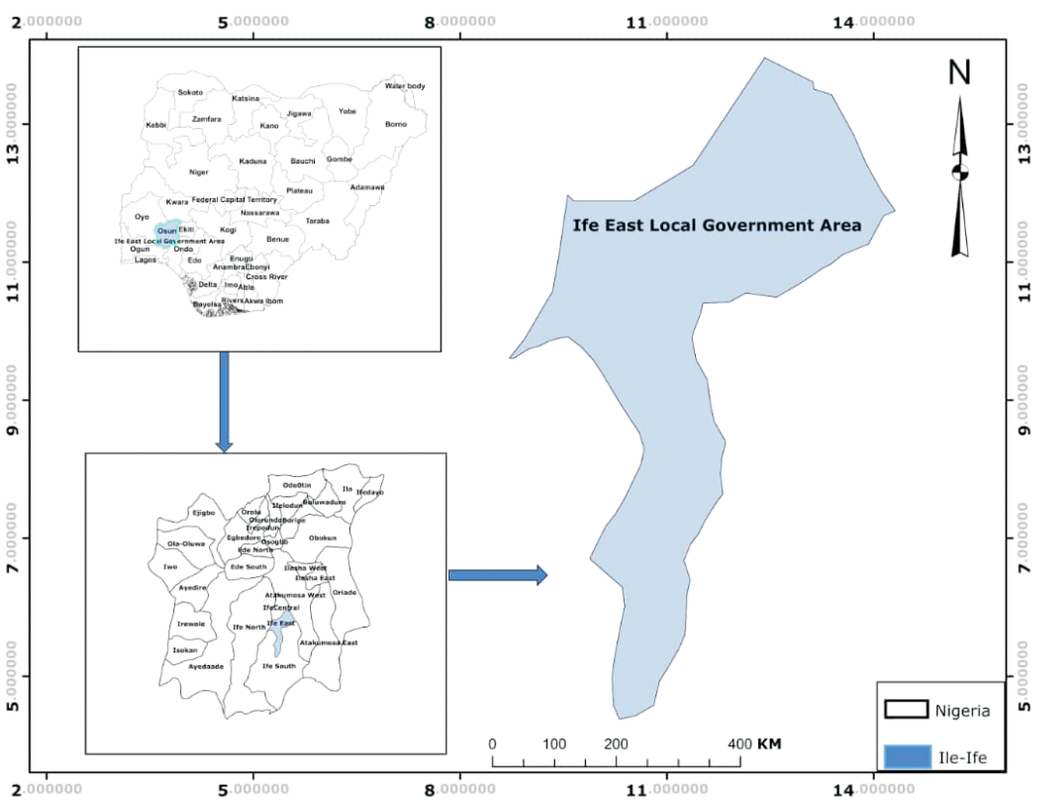

Figure 1: The Study Location

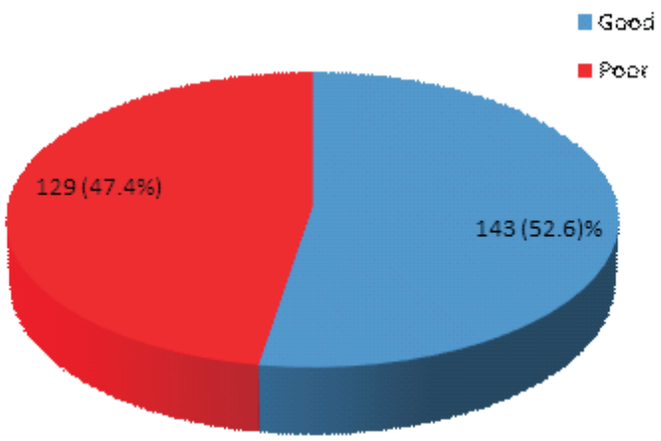

Figure 2: Categorization of Malaria Prevention Practices in the Households