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Research Article

Influence of Phone and Internet Use on the Use of Insecticide-treated Bed Nets Among Pregnant Women: Analysis of DHS 2021 Data

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Abstract

Background: Malaria remains a major cause of morbidity and mortality in sub-Saharan Africa, particularly among pregnant women. Insecticide-treated nets (ITNs) are an effective preventive measure; however, their use in Guinea remains below the World Health Organization's recommended threshold of at least 80%. At the same time, the rapid expansion of information and communication technologies, particularly mobile phones and the Internet, provides new opportunities to promote positive health behaviors. Nevertheless, little is known about the influence of these technologies on ITN use among pregnant women in Guinea. This study aimed to assess the association between mobile phone and Internet use and ITN utilization among pregnant women. Methods: A cross-sectional analytical study was conducted based on secondary analysis of data from the 2021 Guinea Malaria and Anemia Indicator Survey (EIPAG). The study population included women aged 15–49 years who had given birth within the three years preceding the survey. Data analyses were performed using R software version 4.1.3 to describe the sample, conduct bivariate analyses, logistic regression, and regression tree modeling to identify predictive factors. Results: Among the participants, 2,225 women (57%) reported sleeping under an ITN the night before the survey. After adjustment, mobile phone use (73%) and Internet use (24%) were not significantly associated with ITN utilization. In contrast, several factors were significantly associated with higher ITN use, including higher parity (OR = 1.43; 95% CI: 1.17–1.76 for 2–5 children and OR = 1.72; 95% CI: 1.32–2.24 for ≥6 children), attending at least four antenatal care visits (OR = 1.42; 95% CI: 1.17–1.73), access to radio (OR = 1.25; 95% CI: 1.07–1.45), and receiving malaria prevention messages (OR = 1.53; 95% CI: 1.32–1.77). Conversely, large household size and an indirect relationship to the household head were associated with lower ITN use. Conclusion: Mobile phone and internet use had no significant influence on ITN utilization among pregnant women in Guinea. Factors such as household size, relationship to the household head, access to radio, parity, and number of ANC visits were significant predictors of ITN use. Strengthening programs aimed at improving ANC attendance, enhancing radio access, and intensifying media campaigns are recommended to optimize ITN utilization among pregnant women.

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Keywords

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1. Introduction

Malaria remains a major public health problem, particularly in low- and middle-income countries, and Africa continues to bear the brunt of this disease, accounting for 96% of all malaria deaths in 2020, with children under five being the primary victims [1].

In Guinea, the evolution of parasite prevalence places it among the sub-Saharan African countries where malaria is endemic and constitutes a health problem. However, this burden has seen a significant decline. According to the Guinea Malaria and Anemia Indicators Survey (EIPAG-2021), parasite prevalence fell from 44% in 2012 to 17% in 2021 [2]. It should also be noted that between 2016 and 2019, the proportionate malaria morbidity saw a reduction of 12.6%, while the proportionate malaria mortality also decreased by 12%, thanks to the rapid intensification of malaria prevention and control initiatives, carried out by the country's health authorities [3].

Furthermore, over the past twenty years, improved access to WHO-recommended malaria prevention tools and strategies, including effective vector control and the use of antimalarial drugs for prevention, has significantly contributed to reducing the global burden of this disease [4]. In line with these guidelines, Guinea has committed to scaling up proven interventions to have a significant and lasting impact on malaria morbidity and mortality. Long-lasting insecticidal nets (LLINs) are one such intervention and are considered one of the most effective and cost-effective. Therefore, to achieve universal LLIN coverage, four national mass distribution campaigns have been organized since 2013, the most recent of which was conducted in 2022 [5].

The fight against malaria has seen significant progress in Guinea, particularly in its vector control component, thanks to periodic mass distribution campaigns and the implementation of routine multi-channel distribution to health facilities, basic community organizations, schools, and the private sector, to such an extent that EIPAG-2021 showed progress on access to LLINs compared to the 2005 DHS, increasing from 2% to 42%, and use also saw the same trend, increasing from 1% to 33% [2]. Despite these promising results, new vector control strategies aimed at increasing the ownership and use of long-lasting insecticidal nets (LLINs) are needed to achieve, by 2030, a reduction in malaria morbidity and associated mortality of at least 90% compared to 2015, which are the targets considered for malaria elimination [6]. However, various DHSs and the EIPAG survey conducted in Guinea showed that nearly three-quarters of the women surveyed (74%) aged 15–49 years owned a mobile phone and more than a quarter (27%) owned a smartphone. Regarding internet use, nearly a third (31%) reported having used the internet at some point, and 28% had used it in the 12 months preceding the survey [2].

Over the past decade, information and communication technologies (ICTs) have profoundly transformed organizational structures and processes, particularly with the rise of the Internet and network technologies, as well as the widespread use of mobile tools such as laptops and connected phones [7]. This is why, in a context of reduced resources and healthcare spending, but also of increased patient involvement, public health policies are placing growing importance on individuals' personal responsibility for their own health [8].

Guinea has made significant progress in access to and use of long-lasting insecticidal nets (LLINs). The 2021 EIPAG showed a 17-point increase in access to LLINs compared to the 2012 DHS, and use also jumped by more than 10 points [2]. However, these accesses and use rates remain below the WHO guidelines, which aim for a minimum universal coverage of 80% [9]. Therefore, it is necessary to find other innovative strategies to integrate into the communication activities package in order to redirect the various ongoing interventions defined in the strategic plans. Hence the importance of this study, which aims to fill this information gap by examining how new information technologies, through the use of mobile phones and the internet, can contribute to communication for behavior change regarding the correct and consistent use of long-lasting insecticidal nets (LLINs) to effectively combat malaria. The objective of this study is to analyze the determinants of LLIN use among pregnant women aged 15 to 49 in Guinea in 2021, by estimating their coverage levels and describing the associated socio-demographic, economic, and malaria prevention characteristics.

2. Materials and Methods

2.1. Setting and Study Design

This was a cross-sectional analytical study focusing on the secondary analysis of data from the 2021 Survey on Indicators of Malaria and Anemia in Guinea (EIPAG). This survey covered the entire country and field data were collected from July 13 to September 10, 2021.

2.2. Study Population

The study focused on pregnant women aged 15-49 who resided in regular households throughout EIPAG 2021 country.

Included were women aged 15-49 who had given birth in the 3 years preceding the survey and who owned at least one insecticide-treated mosquito net.

Were not included, all women aged 15-49 who gave birth during the last 3 years preceding the survey and who do not have an insecticide-treated mosquito net.

2.3. Sampling Plan

The EIPAG presents a sampling plan similar to that of the EDS comparable in each country. These are stratified surveys with a two-stage draw. The country is divided into several layers (15 layers), one by administrative region and by place of residence. The sampling frame for primary units is made up of enumeration areas (SA) from the last General Population and Housing Census of 2014 [10].

At the first degree, clusters (enumeration area) were selected (169 clusters) by systematic random sampling independently in each stratum, with a probability proportional to their number of ordinary households in the RGPH.

After an exhaustive enumeration of households in each enumeration area, a simple random draw is carried out at the second degree to define the number of selected households (4056 households). In order to take into account, the rigorous sampling plan of the DHS, each database contains a weighting variable, which makes the sample representative at national and regional level. This variable is proportional to the inverse of the probabilistic probability for each household, i.e. the probability that the household in question will be surveyed.

2.4. Study Variables

The dependent variable is the use of long-lasting insecticide-treated mosquito nets by women aged 15 to 49 who had given birth in the last three years preceding the survey. It was coded in a binary way: 1 if the woman slept under a mosquito net the night before the interview, 0 otherwise.

The independent variables considered in this study fall into two broad categories:

Sociodemographic and economic characteristics: internet use, mobile phone use, age group, religion, ethnicity, background of residence, administrative region, education level of the pregnant woman, quintile of economic well-being, household size, relationship with the head of household, sex and age of the head of household, media exposure, as well as parity.

Variables related to malaria prevention: age of pregnancy at first antenatal care (ANC), total number of ANC carried out, and receipt of malaria-related messages in the last six months.

2.5. Data Collection

The EDS program is a tool that aims to provide government and private organizations with the necessary data for planning, monitoring, and evaluation of programs in many areas including health.

Thus, for the realization of this study, we first filled out a registration form on the site https:///www.dhsprogram.com/data/dataset_admin/login_main.cfm before submitting on September 15, 2022, a request for access to the different databases of the EDS surveys indicating the subject on which the work will focus. For response, an email attached with a letter of authorization to download the databases for research purposes was sent to us on September 23, 2022. The bases provided by the DHS program concern the data of EIPAG 2021 as stipulated in the request.

Our analysis focused on the indicators recorded in the re-registration file of household members (or individuals) rated PR and those recorded on the individual (female) re-registration file rated IR.

2.6. Statistical Analyses

Descriptive analyses presented qualitative variables by their frequencies and confidence intervals, and quantitative variables by their medians and quartiles.

Associations were tested using the chi-square test or Fisher's exact test for qualitative variables, and Wald's test for quantitative variables.

Multiple correspondence analysis (MCA) and supervised classification (CART) were used to mitigate multicollinearity.

The MCA components were selected according to Kaiser's and elbow rules.

Interpretation was based on the most significant categories and their cos ².

Mixed logistic regression identified factors associated with the use of insecticide-treated bed nets (ITNs).

Random effects of place of residence and region were included.

The models were compared using the AIC and optimized using the glmulti package according to the BIC.

Variable selection was performed using a backward stepwise method with a 5% significance level. All analyses were performed using R software (version 4.1.3).

2.7. Management of Missing Data

The management of missing data was done based on the nature and proportion of the missing data. When the proportion is less than 5% of the observations, we performed a single imputation under the assumption that the missing data were of the MAR (Missing at Random) type., we have also opted for the principle of replacing the missing values with the predicted value by a regression model including other available variables and when the proportion is greater than or equal to 5% of the observations, we used the multiple imputation technique under

the assumption that the missing data were of the MAR type before performing simple imputations to obtain several samples that were pooled in order to reach a final estimate [11].

2.8. Management of Bias

The stratification of the EIPAG samples follows the same principle as the EDS and took into account urban and rural areas in the eight (08) administrative regions of Guinea for reasons of representativeness. The agents in charge of collection have been trained and the tools pre-tested to reduce information bias. However, to minimize confounding biases, covariates were adjusted in the models and possible interactions between these covariates were tested.

The analyses that were carried out integrated the sampling plan using the 'survey' extension through the R software.

3. Results

The study, conducted among 3,910 women, reveals a predominantly young population (49% aged 20 to 35 years), Muslim (85%) and poorly educated (60% without educational level). More than half live in medium-sized households (5–11 people) headed by men (84%). Access to information remains limited, with only 7.7% having access to newspapers and 24% to the Internet, although 73% have a telephone. In terms of health, 57% sleep under a mosquito net, but 84% start prenatal consultations after three months of pregnancy and 77% only carry out three or less.

Table 1. *Socio-demographic, Economic and Preventive Characteristics of Pregnant Women, EIPAG 2021 Data in Guinea.*

Socio-demographic, economic and preventive characteristics	**N = 3,910[1]** **n (%)**
Age groups	
[15-20]	1 072 (27%)
(20 35]	1 924 (49%)
(35 49]	914 (23%)
Ethnie	
Soussou	689 (18%)
Peulh	1 384 (35%)
Malinke	1 123 (29%)
Kissi	313 (8.0%)
Toma	166 (4.2%)
Guerze	184 (4.7%)
Others	51 (1.3%)
Level of education	
Neither	2 331 (60%)
Primary	791 (20%)
Secondary	639 (16%)
Higher	149 (3.8%)
Household size	
[1-5]	911 (23%)
(5-11]	2 016 (52%)
(11-36]	983 (25%)
Relationship with the head of household	
Direct	3 089 (79%)

Socio-demographic, economic and preventive characteristics	**N = 3,910[1]** **n (%)**
Sex of head of household	
Man	3 288 (84%)
Woman	622 (16%)
Age of the head of household	
[18-38]	1 099 (28%)
(38-60]	1 896 (48%)
(60-98]	915 (23%)
Access to the journal	
No	3 611 (92%)
Access to radio	
No	1 964 (50%)
Access to television	
No	2 109 (54%)
Using the phone (Yes)	2 847 (73%)
Internet use (Yes)	938 (24%)
Economic well-being quintiles	
Poorest	772 (20%)
Poor	752 (19%)
Means	756 (19%)
Rich	799 (20%)
Richer	832 (21%)
Parity	
[0-1]	1 456 (37%)
(1-5]	1 563 (40%)
(5-15]	892 (23%)
Sleep under mosquito net (Yes)	2 225 (57%)
Age of pregnancy at the time of the 1st CPN	
[0-3]	546 (14%)
(3-6]	3 301 (84%)
(6-9]	64 (1.6%)
Number of CPN completed	
[0 3]	3 022 (77%)
(3 6]	699 (18%)
(6 9]	190 (4.8%)
Messages about malaria received in the past 6 months (Yes)	2 337 (60%)

1 Median (IQR); n (%)

The age of pregnant women (p<0.001), level of education (p <0.001), number of people in the household (p <0.001), relationship with the head of household (p<0.001), sex (p <0.007) and age of the head of household (p<0.001), access to media (newspaper (p<0.001), radio (p<0.037), television (p<0.001)), internet use (p<0.001), household standard of living (p<0.001), number of children (p<0.001), age of pregnancy at first CPN (p<0.030), number of PCPs performed during pregnancy (p<0.001) and listening to messages about malaria in the last 6 months (p<0.001) were the factors associated with the use of insecticide-treated mosquito nets in pregnant women. There was no significant difference between the use or not of insecticide-treated mosquito nets and the use of mobile phones, religion and ethnicity (Table 2).

Table 2. *Bivariate Analysis of Insecticide-Treated Mosquito Net Use Among Pregnant Women, EIPAG 2021.*

Variables	**Non use MII N = 1,685[1]** **n (%)**	**Use MII N = 2,225[1]** **n (%)**	**p-value[2]**
Age groups			<0.001
[15-20]	570 (34%)	502 (23%)	
(20 35]	777 (46%)	1147 (52%)	
(35 49]	338 (20%)	577 (26%)	
Ethnie			0.4
Soussou	317 (19%)	372 (17%)	
Peulh	642 (38%)	743 (33%)	
Malinke	437 (26%)	686 (31%)	
Kissi	121 (7.2%)	192 (8.6%)	
Toma	72 (4.3%)	94 (4.2%)	
Guerze	81 (4.8%)	103 (4.6%)	
Others	15 (0.9%)	37 (1.6%)	
Level of education		<0.001	
Neither	913 (54%)	1418 (64%)	
Primary	341 (20%)	451 (20%)	
Secondary	351 (21%)	288 (13%)	
Higher	80 (4.8%)	69 (3.1%)	
Household size		<0.001	
[1-5]	328 (19%)	584 (26%)	
(5-11]	852 (51%)	1164 (52%)	
(11-36]	505 (30%)	478 (21%)	
Relationship with the head of household			<0.001
Direct	1214 (72%)	1875 (84%)	
Sex of head of household		0.007	
Man	1365 (81%)	1923 (86%)	
Woman	320 (19%)	302 (14%)	

Variables	**Non use MII N = 1,685[1]** **n (%)**	**Use MII N = 2,225[1]** **n (%)**	**p-value[2]**
Age of the head of household		<0.001	
[18-38]	398 (24%)	701 (31%)	
(38-60]	829 (49%)	1067 (48%)	
(60-98]	458 (27%)	457 (21%)	
Access to the journal		<0.001	
No	1514 (90%)	2097 (94%)	
Access to radio		0.037	
No	892 (53%)	1,072 (48%)	
Access to television		<0.001	
No	790 (47%)	1319 (59%)	
Using the phone (Yes)	1234 (73%)	1613 (72%)	0.7
Internet use (Yes)	505 (30%)	432 (19%)	<0.001
Economic well-being quintiles		<0.001	
Poorest	283 (17%)	489 (22%)	
Poor	283 (17%)	470 (21%)	
Means	336 (20%)	420 (19%)	
Rich	356 (21%)	443 (20%)	
Richer	427 (25%)	405 (18%)	
Parity		<0.001	
[0-1]	800 (48%)	655 (29%)	
(1-5]	595 (35%)	968 (43%)	
(5-15]	289 (17%)	602 (27%)	
Age of pregnancy at the time of the 1st CPN		0.030	
[0-3]	218 (13%)	328 (15%)	
(3-6]	1450 (86%)	1850 (83%)	
(6-9]	16 (1.0%)	47 (2.1%)	
Number of CPN completed		<0.001	
[0 3]	1366 (81%)	1656 (74%)	
(3 6]	234 (14%)	465 (21%)	
(6 9]	85 (5.0%)	105 (4.7%)	
Messages about malaria received in the past 6 months	916 (54%)	1421 (64%)	<0.001

1 Median (IQR); n (%) 2 t-test adapted to complex survey samples; Wald test of independence for complex survey samples

Exploratory Analyses

1) Multiple correspondence analysis:

The correlation of variables with the first two dimensions and the highlighting of the most important categories allowed us to explain the majority of the differences observed in the sample.

2) Classification and regression tree:

The hierarchical classification on main component through this figure shows the number of children per pregnant woman (parity) that discriminates between profiles, thus four groups (clusters) emerge. The variables that characterize most groups/clusters are the variables household size and the relationship with the head of household. Each cluster is characterized by one of the modalities of these variables. The four (04) clusters made it possible to determine four profiles:

3) If the number of children is less than or equal to 1:

The class where the number of people in the household is at least 5, pregnant women slept more under the mosquito net compared to the class where the number of people in the household exceeds 5.

4) If the number of children is greater than 1:

When women had a direct link with the head of household, they slept more under the mosquito net compared to women whose link with the head of household was indirect.

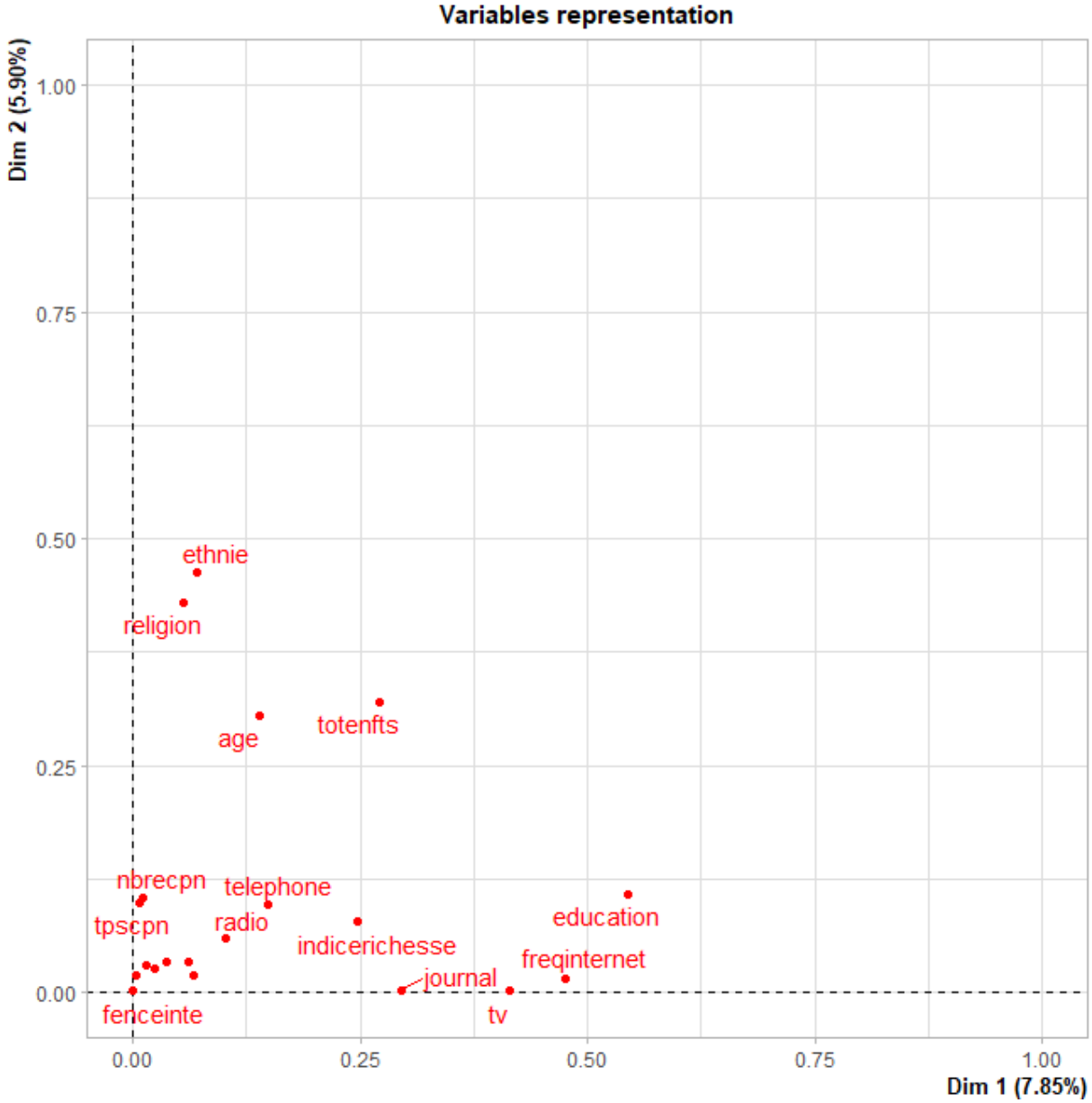

Figure 1. *Representation of the Modalities on the First Two Axes.*

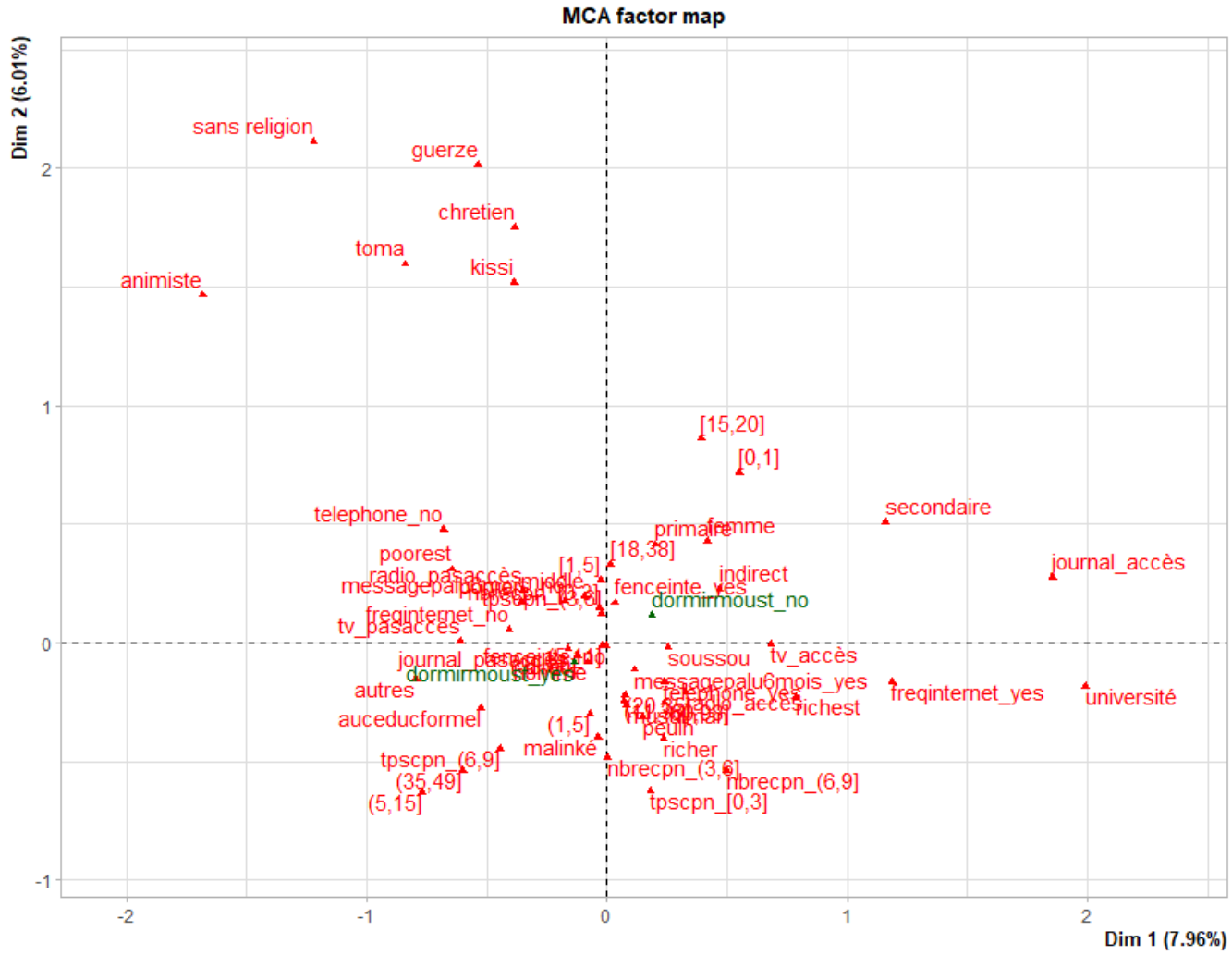

Figure 2. *Factorial Plan of Variables.*

Table 3 of the multivariate analysis revealed that in households where more people live (> 5 to people), women are less likely to use insecticide-treated mosquito net (OR= 0.71; 95% CI = 0.59 – 0.85 and OR = 0.48; 95% CI = 0.39 – 0.60 respectively) in relation to small households (1 to 5 people). Regarding the relationship with the head of household, the model reveals that those who had an indirect relationship with the head of household were 29% less likely to use ITN (OR= 0.71; 95% CI = 0.59 – 0.86) compared to those who had a direct relationship with the head of household. The same is true for households where women are heads of household who were 26% less likely to use ITN (OR= 0.74; 95% CI = 0.61 – 0.90) compared with households where men are head of household. Pregnant women who have household heads over the age of 39 are less likely to use ITN (OR= 0.79; 95% CI = 0.66 – 0.95 and OR = 0.68; 95% CI = 0.55 – 0.85 respectively) compared to those with heads of household younger (<39 years). Women who had access to radio were 99% more likely to use ITN (OR= 1.25; 95% CI = 1.07 – 1.45) compared to those who did not have access. Just like women who have more children (to 2 children), they are more likely to use ITN (OR= 1.43; 95% CI = 1.17 – 1.76 and OR = 1.72; 95% CI = 1.32 – 2.24 respectively) than those with fewer children. As for pregnant women who did more than 3 CPN's, they are also more likely to use MII (OR= 1.42; 95% CI = 1.17 – 1.73; OR = 1.09; 95% CI = 0.79 – 1.50) than those who did less than 3 CPN s. The model reveals that pregnant women who received malaria awareness messages in the last 6 months prior to the survey are more likely to use ITN (OR= 1.53; 95% CI = 1.32 – 1.77) than those who did not receive messages.

Table 3. *Multivariate Analysis of Insecticide-treated Mosquito Net Use During Pregnancy, EIPAG 2021.*

Predictors	**Use of MII**		
	Odds Ratios	**95% CI1**	**p-value**
Age groups			
(Intercept)	1.44	1.03 – 2.03	0.034
[15,20]	—	—	
(20,35]	1.16	0.94 – 1.42	0.171
(35,49]	1.18	0.90 – 1.56	0.234
Ethnicity			
Peulh	0.96	0.75 – 1.22	0.742
Malinke	1.11	0.83 – 1.48	0.483
Kissi	0.91	0.61 – 1.35	0.629
Toma	0.72	0.44 – 1.19	0.201
Guerze	0.81	0.51 – 1.29	0.381
Others	1.56	0.82 – 2.96	0.178
Level of education			
Neither	1.15	0.95 – 1.39	0.165
Primary	1.00	0.79 – 1.26	0.999
Secondary	1.40	0.92 – 2.14	0.118
Household size			
[1-5]	—	—	
(5-11]	0.71	0.59 – 0.85	<0.001
(11-36]	0.48	0.39 – 0.60	<0.001
Relationship with the head of household			
Direct	—	—	
Indirect	0.71	0.59 – 0.86	<0.001
Sex of head of household			
Man	—	—	
Woman	0.74	0.61 – 0.90	0.003
Age of the head of household			
[18-38]	—	—	
(38-60]	0.79	0.66 – 0.95	0.011
(60-98]	0.68	0.55 – 0.85	0.001
Access to radio			
No	1.25	1.07 – 1.45	0.005
Access to television			
No	0.91	0.76 – 1.09	0.306
Internet use			
Yes	0.86	0.71 – 1.04	0.110

Predictors	Use of MII		
	Odds Ratios	95% CI1	p-value
Parity			
[0-1]	—	—	
(1-5]	1.43	1.17 – 1.76	0.001
(5-15]	1.72	1.32 – 2.24	<0.001
Number of CPN completed			
[0 3]	—	—	
(3 6]	1.42	1.17 – 1.73	<0.001
(6 9]	1.09	0.79 – 1.50	0.606
Messages about malaria received in the past 6 months			
Yes	1.53	1.32 – 1.77	<0.001
Random Effects			
σ^2	3.29		
$\tau_{00\ region}$	0.36		
$\tau_{11\ region.\ residencerural}$	0.60		
$\rho_{01\ region}$	-0.96		
ICC	0.10		
N_{region}	8		
Observations	3912		
Marginal R2 / Conditional R2	0.179		

4. Discussion

This study aimed to examine the influence of mobile phone and internet use on the use of insecticide-treated bed nets (ITNs) among pregnant women in Guinea, using data from the 2021 EIPAG [12].

Contrary to our initial hypothesis, the results show that mobile phone and internet use are not significantly associated with ITN use after adjusting for covariates. This finding suggests that access to digital technologies, although increasing, does not necessarily translate into a change in malaria prevention behavior in this context. More broadly, these observations confirm that ITN use among pregnant women remains below recommended targets in many sub-Saharan African countries [13–16]. However, these results differ from those reported in Ghana and Pakistan, where mobile phone use, particularly for sending awareness SMS messages, was associated with greater knowledge and more frequent use of mosquito nets [17, 18]. This discrepancy could be explained by differences in national communication strategies, effective access to digital health information, or the level of digital literacy among the populations concerned.

Conversely, several sociodemographic, family, and information access factors proved to be significant determinants of insecticide-treated bed net (ITN) use. Household size was inversely correlated with ITN use among pregnant women: those living in larger households were less likely to use one than those living in smaller households. This finding is consistent with several recent studies conducted in sub-Saharan Africa, which have shown that large households often have an insufficient number of mosquito nets relative to the number of people, thus limiting their use [13, 15, 16, 19, 20].

The relationship to the head of household also influences the use of insecticide-treated nets (ITNs). Women with an indirect relationship to the head of household used ITNs less frequently, which could reflect reduced decision-making autonomy or more limited access to prevention resources. Furthermore, contrary to some previous studies that reported higher use of ITNs in male-headed households, our results indicate relatively higher use when the head of household is female. This difference could be related to women's greater awareness of maternal and child health issues, as also suggested by some recent studies in West Africa [21, 22].

Access to radio was found to be an important determinant

of ITN use. Women exposed to this media were significantly more likely to use an insecticide-treated bed net. This finding confirms the importance of community media in disseminating public health messages and aligns with the conclusions of recent studies highlighting the central role of radio in promoting malaria prevention behaviors [23–25].

Furthermore, parity and the number of antenatal visits appear to be major positive determinants of ITN use. Women with more children and those who had multiple antenatal visits were more likely to sleep under an insecticide-treated bed net. This observation confirms the importance of antenatal visits as a key setting for raising awareness, distributing bed nets, and promoting preventive behaviors, as also demonstrated by recent studies conducted in Ethiopia, Benin, and other sub-Saharan African countries [24, 26–28].

Finally, listening to malaria awareness messages in the six months preceding the survey was strongly associated with cumulative use of insecticide-treated bed nets. This finding highlights the importance of repeated communication campaigns for behavior change. Several recent studies have shown that the use of insecticide-treated bed nets, combined with adequate care during pregnancy, is associated with a reduction in maternal malaria as well as improved neonatal indicators, including birth weight and hemoglobin levels [19, 21, 29].

While this study provides new insights into the determinants of insecticide-treated bed net use among pregnant women in Guinea, some limitations must be considered. The use of cross-sectional data does not allow for further analysis.

5. Conclusion

This study reveals that the use of mobile phones and the internet has no influence on the use of insecticide-treated mosquito nets by pregnant women in Guinea. On the other hand, factors such as the size of the household, the link with the head of household, the sex and the age of the head of household, access to radio, the number of children and CPN carried out as well as listening to awareness messages about malaria during the last 6 months preceding the survey were the most significant predictors that would promote the use of IBD among women during the pregnancy. However, larger households, pregnant women who have less NPC and do not have access to radio are some factors that limit the use of ITN. Based on this analysis, it is essential to strengthen strategies aimed at raising awareness among pregnant women about the use of prevention methods against malaria during CPN and on radio. However, it is recommended that policies focus on reducing poverty in our communities by strengthening programs dedicated to birth spacing and family planning, improving the use of prenatal care services among pregnant women, strengthen access to radio and media campaigns at the community level for pregnant women aimed at optimal use of IBD and enable Guinea to achieve international and national objectives in malaria control to reduce the burden of the disease.

Abbreviations

DHS	Demographic and Health Surveys
ITN	Insecticide-Treated Net
EIPAG	Guinea Malaria and Anemia Indicator Survey
ANC	AnteNatal Care
WHO	World Health Organization
LLIN	Long-lasting insecticidal net
ICT	Information and Communication Technologies
EDS	Demographic and Health Survey
RGPH	General Census of Population and Housing
MAR	Missing at Random
MCA	Multiple Correspondence Analysis
AIC	Akaike Information Criterion

Author Contributions

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Data Availability Statement

The data that support the findings of this study can be found at: https://www.dhsprogram.com/data/dataset_admin/login_main.cfm

Conflicts of Interest

The authors declare no conflicts of interest.

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Biography

Sekou Sidate Sylla is a public health physician and epidemiologist, currently the Prefectural Director of Health for Dalaba in Guinea. He holds a Doctorate in Medicine (Gamal Abdel Nasser University of Conakry), a Master's degree in Public Health (Aix-Marseille University), and a Master's degree in Health Institution Management (ESC Clermont), with specialized training in vaccinology and field epidemiology (Nazi Boni University, University of Cape Town, CDC/AFENET). With over ten years of experience, he has collaborated with the WHO, the ANSS (National Health Security Agency), the CDC Guinea, and AFENET on surveillance and response to epidemics (Ebola, measles, cVDPV2 polio, COVID-19), the coordination of vaccination activities, and the strengthening of health systems. He has also conducted research presented and published internationally and contributed to the development of national technical guidelines.

Research Field

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