



## PATTERNS OF MANAGEMENT OF MALARIA IN PREGNANCY AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE FACILITIES AT ILISHAN-REMO, NIGERIA

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**ABSTRACT:** *Malaria in pregnancy is a treatable infectious disease and remains a major cause of maternal, in-utero morbidity and mortality. Pregnant women are often vulnerable and treat malaria using different patterns of measures. However, this study was conducted to identify patterns of management of malaria in pregnancy among pregnant women in Ilishan Remo, Ogun State. A cross-sectional design study was used, and a sample of 271 consented pregnant women were purposely selected at ante-natal care (ANC) facilities in Ilishan-Remo. A self-administered questionnaire obtained information on 35 items. The data were analyzed for descriptive (frequency and percentages) and hypothesis was tested using chi-square at  $p$ -value  $\leq 0.05$ . For the socio-demographic features of the respondents, 38.4% age ranges from 25 to 40, one-third (38.4%) were traders. 80.8% of the population were Christians and nearly half (49.1%) had tertiary education. Less than a quarter (16.6%) of the pregnant women often and always used artemisinin combined therapy (ACT) for malaria in pregnancy management. Majority (76.8%) rarely used faith homes measures including holy water, soap and oil. Facilities and resources were statistically significant to Patterns of management used ( $p < 0.005$ ). Conventional pattern of management used by majority and influenced by health facilities. There is still a need to encourage pregnant women to follow the standard FMOH/WHO pattern of malaria management.*

**KEYWORDS:** Patterns of management, Malaria in Pregnancy, Pregnant women, Malaria.



## INTRODUCTION

Malaria in pregnancy (MIP) is a major cause of maternal, in-utero, infant morbidity and mortality. A common prevailing ailment in the developing nations. Predominantly, malaria constitutes a great burden in the sub-Saharan Africa region, in particular, Nigeria and Democratic Republic of Congo, where malaria accounted for more than 35% of the 88% cases (National Multiple Indicator Cluster Survey (NMICS) & Federal Ministry of Health (FMOH), 2015; WHO, 2018 and 2019). Annually, about 50 million pregnancies are at risk of malaria infection in Africa, and the majority of the pregnant women are living in Nigeria. Consequently, an estimated 11% died of malaria during pregnancy out of the 70% malaria pregnancy cases (National Population Commission (NPC), 2008; NMICS, 2015; Noland et al., 2018).

Malaria is a notifiable endemic infectious disease caused by plasmodium (*falciparum*, *vivax*, *malariae*, *ovale* and *knowles*) species. It commonly affects the pregnant women due to affinity to her hormones and the unique maternal blood taste and concomitantly affects the in-utero and under-five children due to their low immunity level (WHO, 2016; Rogerson, Duffy, Leke & Taylor, 2015). Sometimes, malaria in pregnancy may not manifest as febrile or/and with other clinical criteria, which makes it more common and dangerous in pregnant women as it might become severe before diagnosis. Malaria in pregnancy may interfere with maternal-foetal exchange in the placenta thereby causing low birth weight, still births, abortions, preterm, and failure of infants thriving (WHO, 2016). In mother, it causes anemia, miscarriage and subsequently other pregnancy complications (shock and death) (Bekele, 2016). However, several concerted efforts implored to halt malaria in pregnancy, including management therapy like using intermittent preventive therapy - sulphadoxine pyrimethamine (IPT-SP), mono-artemisinin and artemisinin combination therapy (ACT), yet malaria is re-emerging with its toll effects on the pregnant women, and under-five children (Roll Back Malaria and SDGs, 2018).

The national malaria control policy and programme, specifically, identify integrated malaria management as an effective case management. Similarly, the World Health Organization recommended a modifiable pattern of management (malaria control) for pregnant women as prompt diagnosis and case management of malaria illness for endemic regions (WHO, FMOH & RBM, 2015). Generally, pregnant women sought various management patterns aside from the recommended approach for the control of malaria. Though, some of the patterns are beneficial despite not prescribed or recommended, while others could pose risk to pregnancy and its outcomes such as (herbs/herbal concoction, self-medication (Alessandro et al., 2018). More so, some malaria self-medicated therapy that seems beneficial could likely have otherwise effects. Nonetheless, pregnant women are persistently influenced by a number of factors, such as socio-economic, traditional and religious beliefs, behavioral, knowledge, family members, attitude and perception on patterns of prevention and management use for malaria (Exavery et al., 2015; Pell et al., 2016). Malaria in pregnancy outcome is terrifying and consequential. Hence, there is a need to identify patterns of management of malaria in pregnancy among pregnant women in Ilishan-Remo area of Ogun State.



## **Objective of the Study**

The general objective of this study is to identify patterns of prevention and management of malaria among pregnant women in Ilishan Remo, Ogun State, Nigeria.

The specific objectives of the study are to:

1. Identify the patterns of malaria management among pregnant women attending selected antenatal care facilities; and to
2. Determine the factors associated with patterns of malaria management among pregnant women.

## **Research Questions**

1. What patterns of malaria management are used by pregnant women attending selected antenatal care facilities?
2. What are the factors associated with the patterns of malaria management used by pregnant women in the Ilishan-Remo community?

## **Hypothesis**

1. There is no significant relationship between socio-demographic characteristics and patterns of malaria management used by pregnant women.

## **Significance of the Study**

The study is of high importance as the findings may help in presenting the patterns of malaria in pregnancy management specifically, to the various regimens adopted for use. It may also identify factors associated with management of malaria in pregnancy in Ilishan-Remo. Perhaps, it could serve as a template for deliberating malaria plans and policy and even review of the management patterns of malaria in pregnancy.

## **Scope of the Study**

The study was conducted on the patterns of management of malaria among pregnant women attending Ante-natal Clinics in Ilishan Remo Community.

## **METHODOLOGY**

### **Research Design**

A descriptive cross-sectional design was used to identify patterns of management of malaria among pregnant women attending Antenatal clinic in Ilishan- Remo, Ikenne Local Government Area, Ogun State.

### **Research Setting**

This study was carried out in Ilishan-Remo community, Ikenne Local Government Area, Ogun State. Ilishan-Remo is a centrally located community in the heart of Remo Land and situated



within Irepodun District in Ikenne Local Government Area. It shares borders with neighboring towns. It is bounded by Ikenne in the north, Ayepe and part of Odogbolu; by Iperu, Ogere, Ajia, Isiun in the South; by Irolu, Ijesha-Ijebu and Ago-iwoye in the East; while in the west by Sagamu and part of Iperu-Remo, Ogun State. It comprises the town and town planning areas respectively and has two political wards with a total population of 10,309 (National Population Commission (NPC), 2006). Majority of the people in the community are into trading. Culturally, her people celebrate Egungun festival, Isanbi day, Isemo/Oro, among others (Badmus, 2002; Adamo, 2007). The community has facilities like health, schools and so on. The antenatal facility comprises a private tertiary health institution, three Primary Health Centres (PHC), two mission houses and traditional birth attendants (Abiye) distributed at different locations within the study area.

### **Research Population**

The target population for the study comprised the booked pregnant women attending antenatal clinics in the selected facilities in Ilishan-Remo Community, Ogun state.

### **Inclusion Criteria**

1. Pregnant women attending ANC facilities in Ilishan-Remo community.
2. Pregnant women that were willing to participate in the study at selected health facilities in Ilishan-Remo, Ogun State

### **Exclusion Criteria**

1. Pregnant women that did not book and/or visit ANC facilities for the first time.

### **Sample Size Determination**

Using the sample size formula for cross sectional studies:

$$n = Z^2pq/d^2 \text{ (Leslie Kish Formula)}$$

Where  $Z = 1.96$ , (Level of significance of 5% (1.96))

$p = 82\%$ , (as the proportion of pregnant women utilizing prevention and management of malaria in a rural community of Ogun state, Nigeria by Adeneye et al., 2014)

$$q = 1 - p = 18\%$$

$$d = 5\% \text{ (precision accuracy)}$$

$n =$  Sample size

$$n = 1.96^2 \times 0.8 \times 0.2 / 0.05^2$$

$$n = 3.84 \times 0.8 \times 0.2 / 0.0025$$

$$n = 245.76$$

$$n = 246$$



The study sample size is 246 with non-response rate of 10% added at approximately 25.

Therefore, the total estimated number of expected respondents for the study is  $n = 271$ .

### Sample and Sampling Technique

1. The study was carried out in four selected antenatal care facilities in Ilishan-Remo.
2. Average pregnant women attendees per month in the selected ANC facilities were 440
3. Based on the attendance per month, the sample size of 271 pregnant women were proportionally selected for the study.
4. The pregnant women were purposely selected since the sample size of 271 was actualized.

**Table 3.1: Proportion of selection of participants in Selected ANC facilities.**

ANC facilities	Average pregnant women attendees per month in the ANC facilities in Ilishan-Remo Community, Ogun State	Calculations of sample size	Proportion of selection of respondents in ANC facilities.
Babcock University Teaching Hospital (BUTH)	200	$200 \times 270 / 440 = 124$	124
PHC 1 (Town Hall)	80	$80 \times 270 / 440 = 49$	49
Community Hospital	1001	$100 \times 270 / 440 = 61$	61
PHC 2 (Old police station Ago-Ilara)	60	$60 \times 270 / 440 = 37$	37
TOTAL	440		271

### Instrumentation

A self-developed questionnaire was constructed on the management of malaria in pregnancy. The questions were generated using the specific objectives of the study and 35-question items were formed into sections (A-C) as;

Section A comprised six closed ended questions that assessed the socio-demographic characteristics.

Section B contained 19 closed ended questions on a rating scale of (1-3) that identified the patterns of malaria management among pregnant women with always, often and seldom.

Section C includes 10 closed ended questions to determine the factors associated with the patterns of management of malaria in pregnancy with true and false.

The instrument was translated to Yoruba language by an expert in linguistics to enable those that did not understand English language to participate in the study.



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## **Reliability and Validity of the Instrument**

### **Validity of the Instrument**

The validity of the instrument was determined by subjecting it to face and content validity, by scrutinizing it to measure patterns of management of malaria in pregnancy.

### **Reliability of the Instrument**

The instrument was pre-tested on 27 pregnant women at a neighboring town primary healthcare center, Iperu–Remo community, Ogun state on patterns of management for malaria in pregnancy and Cronbach's alpha coefficient score was 0.78.

### **Data Collection Procedure**

A self-administered method was used to collect data from study participants after approval was gotten from the BUHREC ethical committee. The approval and letter of permission were taken to the ANC facilities where data collection took place. The purpose of the research was explained to the participants at facilities and research assistants seek their consents to gain full participation. Pregnant women that were willing, accepted an informed consent form to sign before participating in the study. The researcher guaranteed the confidentiality of the participants as anonymous. The data collection took eight weeks duration, and with the aid of three trained research assistants on the clinic days only.

### **Method of Data Analysis**

The study data were sorted, coded, and entered into the spreadsheet and analyzed by using SPSS version 23.0 statistical software (SPSS inc USA). The section on patterns of management was classified into conventional, non-conventional and combination of conventional and non-conventional patterns based on the sources of the therapy, responses were captured. The variables were analyzed descriptively; percentage and frequency, and bivariate; using chi-square test for hypothesis P-value <0.05.

### **Ethical Consideration**

Ethical approval was obtained from Babcock University Health Research Ethics Committee (BUHREC). Letters of introduction were given to ANC facilities at Ikenne Local Government. Also, the participants were fully informed about the nature of the study and that the participation was voluntary. The researcher ensured anonymity, beneficence and nonmaleficence.



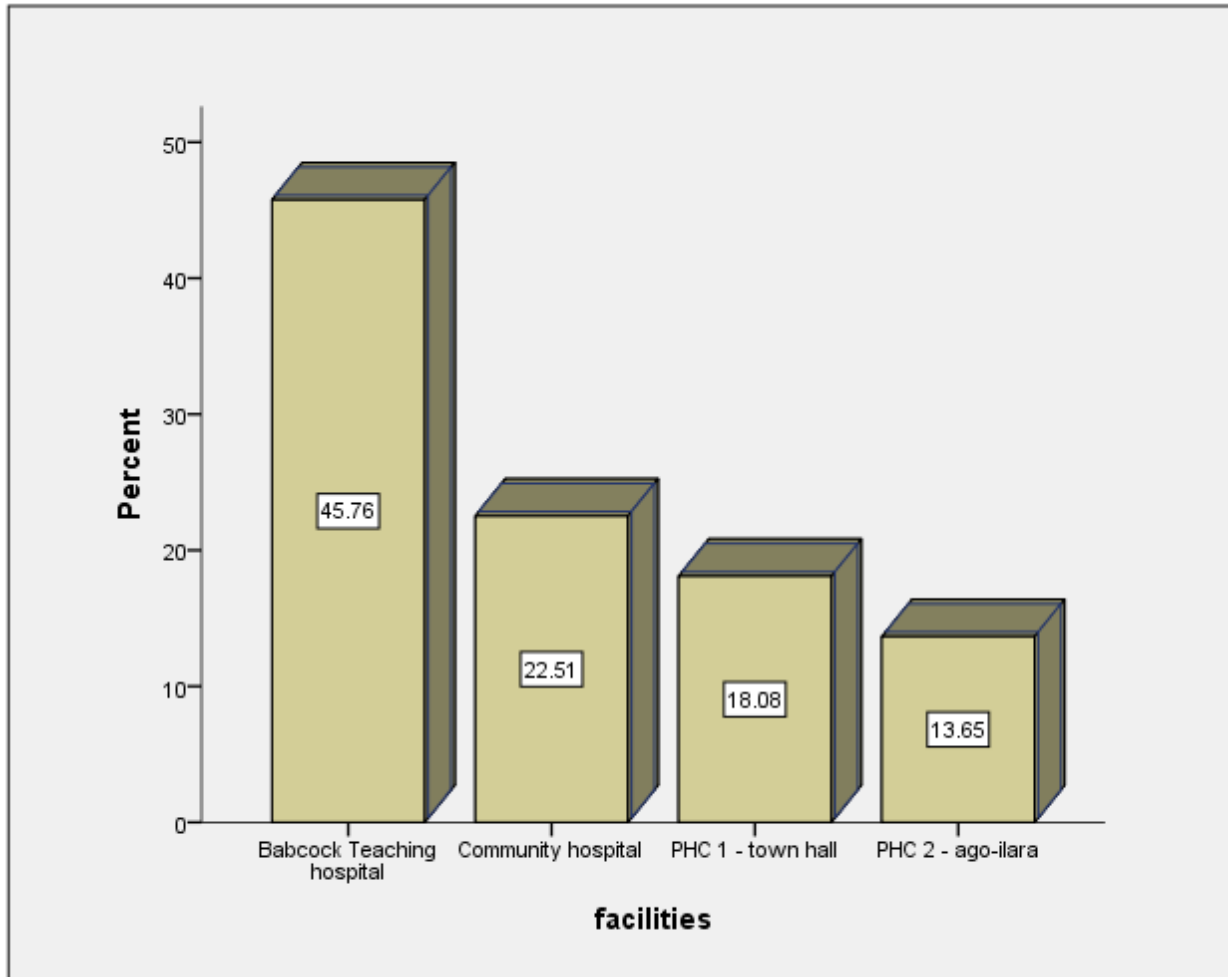
## RESULTS FINDINGS

**Table 4.1: Socio-demographic characteristics of pregnant women attending ante-natal facilities.**

S/N	Socio-demographic	Frequency (n-271)	Percentage (%)
<b>1.</b>	<b>Age</b>		
	≤ 25 years	43	15.9%
	26- 30 years	78	28.8%
	31- 35 years	96	35.4%
	36 – 40 years	37	13.7%
	41 years and above	17	6.3%
<b>2.</b>	<b>Occupation</b>		
	Civil servant	66	24.4%
	Trader	104	38.4%
	Artisan	59	21.8%
	Apprentice	17	6.3%
	Full house wife	25	9.2%
<b>3.</b>	<b>Educational level</b>		
	No formal education	15	5.5%
	Primary	27	10.0%
	Secondary	96	35.4%
	Tertiary	133	49.1%
<b>4.</b>	<b>Ethnicity</b>		
	Yoruba	175	64.6%
	Igbo	60	22.1%
	Hausa	18	6.6%
	Others (minority)	18	6.6%
<b>5.</b>	<b>Religion</b>		
	Christianity	219	80.8%
	Islam	51	18.8%
	Traditional	1	0.4%
<b>6.</b>	<b>Income level</b>		
	≤ 20000	68	25.1%
	21000 – 30000	51	18.8%
	31000 – 40000	39	14.4%
	41000- 50000	34	12.5%
	51000 and above	79	29.2%

Table 4.1 shows the socio-demographic distribution of pregnant women characters; one-third (35.4%) of the respondents were between ages 31-35 years, 26-30 years (28.8%) and 15.9% pregnant women were less than 25 years. Slightly more than one-third (38.4%) of the pregnant women were traders and few (6.3%) were apprentices. Pregnant women had different educational levels, almost half (49.1%) had tertiary education, and others had secondary (35.4%), Primary (10.0%) and no formal education (5.5%) respectively. Majority (80.8%) were Christian, and very few (0.4%) traditional worshipers. Two-third (64.6%) of the pregnant

women were Yoruba, and other minority tribes (Egun, Irobo) were 6.6% respectively. Almost one-third (29.2%) earned 51,000 and above naira as monthly income, 25.1% earned the least income of less than 20,000 naira.



**Figure 4.1: Proportion of pregnant women attending ante-natal in health facilities**

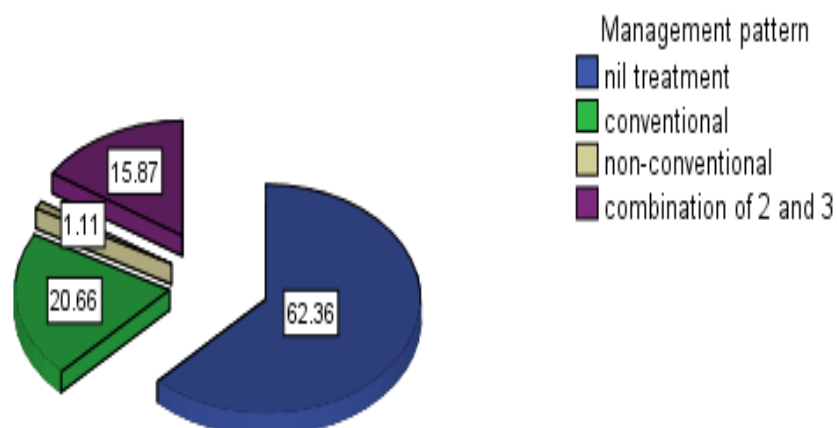
The above bar chart diagram shows the percentage distribution of attendees (pregnant women) visiting the ante-natal care units of the four health facilities.



**Table 4.3: Pattern of Management Adopted among Pregnant Women**

S/N	Malaria Management Items	Frequency (n-271) Percentage (100%)		
		Always n (%)	Often n (%)	Seldom n (%)
	Diagnosed with clinical features(signs and symptoms)	7 (2.6%)	57 (21.0%)	207 (76.4%)
	Diagnosed with laboratory microscopic test	13 (4.8%)	38 (14.0%)	220 (81.2%)
	Diagnosed by Rapid diagnostic testing (RDT) kit	8 (3.0%)	30 (11.1%)	233 (86.0%)
	Rest	27 (10.0%)	122 (45.0%)	122 (45.0%)
	Paracetamol with ferrous	18 (6.6%)	122 (45.0%)	131 (48.3%)
	Panadol extra only	0 (0.0%)	23 (8.5%)	248 (91.5%)
	Sulphadoxine/Pyrimethamine (Fansidar)	3 (1.1%)	6 (2.2%)	262 (96.7%)
	Salicylate (Alabukun) powder	0 (0.0%)	0 (0.0%)	217 (100.0%)
	Quinine	10 (3.7%)	45 (16.6%)	216 (79.7%)
	Chloroquine	0 (0.0%)	6 (2.2%)	265 (97.8%)
	Fansidar (SP)	3 (1.1%)		262 (96.7%)
	Artemisinin Combined Therapy (ACT) e.g Amala	45 (16.6%)	54 (19.9%)	172 (63.5%)
	Mixture of herbs with drink(Gin, Alcohol, 7up, fermented cold pap water, hot pap)	0 (0.0%)	0 (0.0%)	271 (100.0%)
	Drinking juice from aloe vera	0 (0.0%)	13 (4.8%)	258 (95.2%)
	Moringa powder	0 (0.0%)	1 (0.4%)	270 (99.6%)
	Taking, Bathing, and rubbing faith-based measures (oil, soap and water)	20 (7.4%)	43 (15.9%)	208 (76.8%)
	Bathing or shower with water	19 (7.0%)	104 (38.4%)	148 (54.6%)

Table 4.3 shows the management used by pregnant women for malaria in pregnancy. Majority (81.2%) of the pregnant women were diagnosed with malaria in pregnancy with clinical features, symptoms or signs. Predominantly, 81.2% and 86.0% of pregnant women are seldom diagnosed with malaria by laboratory microscopic and rapid diagnostic testing kits respectively. Many (79.7%) rarely used quinine for malaria and few (16.6%) often and 3.7% always used quinine for malaria treatment in pregnancy. Virtually all (97.8%) rarely took chloroquine for malaria treatment, and (45.0%) often took paracetamol with ferrous to manage malaria in pregnancy respectively. Nearly one-fifth (19.9%) and (16.6%) of pregnant women often and always use artemisinin combined therapy (ACT) for management of malaria in pregnancy. A quarter, 15.9%, often and 7.4% always used faith measures for malaria management in pregnancy. Predominant number of pregnant women seldom used traditional herbal care; almost all 99.6% and 95.2% seldom used moringa and aloe vera for management.



**Figure 4.2: Proportion of categorized pattern of management used among pregnant women**

**Table 4.5: Factors associated with the pattern of management adopted at malaria in pregnancy by pregnant women**

	Associated factors	Frequency (n-271)	Percentage (%)
	<b>Previous malaria experience in pregnancy</b>		
	True	180	66.4%
	False	91	33.6%
	<b>Previous pregnancy outcome</b>		
	True	186	68.6%
	False	85	31.4%
	<b>Level of education</b>		
	True	173	63.8%
	False	98	36.2%
	<b>Cost of treatment</b>		
	True	217	100.0%
	False	0	0.0%
	<b>Resources at facility</b>		
	True	261	96.3%
	False	10	3.7%
	<b>Accessibility of services</b>		
	True	271	100.0%
	False	0	0.0%
	<b>Negative attitude of attendance</b>		
	True	0	0.0%
	False	271	100.0%
	<b>Awareness that malaria is dangerous</b>		
	True	231	85.2%
	False	40	14.8%
	<b>Allergy to specific medication</b>		
	True	125	46.1%



	False	146	53.9%
	<b>Severity of malaria cases</b>		
	True	200	73.8%
	False	71	26.2%

Table 4.4 shows the factors associated with the patterns of management adopted by pregnant women for malaria in pregnancy. Majority (66.4%) of the pregnant women said that previous experience(s) of malaria in pregnancy truly influenced the management measure seeking and 68.6% of the pregnant women said that the previous outcome of pregnancy predicted the pattern of malaria management used in pregnancy. All (100.0%) of the pregnant women claimed that the cost of treatment and the negative attitude of caregivers determined the pattern of management used for malaria respectively. Almost all (96.3%) of the pregnant women claimed that the resources at the facility would influence the pattern of management for malaria. Many (85.2%) of the pregnant women said that being aware that malaria is dangerous in pregnancy would quicken and influence the pattern to use for malaria. Slightly above half (53.9%) pregnant women claimed falsely that being allergic to medication had no influence whatsoever on the pattern of management to use for malaria and almost half (46.1%) said it did determine the management used for malaria in pregnancy. Majority (73.8%) of pregnant women said that the severity of malaria cases would predict the pattern of management to use for malaria in pregnancy.

**Table 4.9: The relationship between the socio-demographic and patterns of management**

S/N	Socio-demographic Variables	Nil management n (%)	Conventional n (%)	Non-conventional n (%)	Combination of conventional and non-conventional n (%)	P-Value	$\chi^2$
	ANC facilities					0.019	19.817
	BUTH	59 (47.9%)	45 (36.3%)	1 (0.8%)	19 (15.3%)		
	Community Hospital	25 (41.0%)	23 (37.7%)	2 (93.3%)	11 (18.0%)		
	PHC 1	14 (28.6%)	20 (40.8%)	0(0.0%)	15 (30.6%)		
	PHC 2	25 (67.6%)	9 (24.3%)	0 (0.0%)	3 (8.1%)		
	<b>Age</b>					0.731	8.672
	≤ 25 years	22 (51.2%)	14(32.6%)	0(0.0%)	7 (16.3%)		
	26- 30 years	35(44.9%)	30(38.5%)	1(1.3%)	12 (15.4%)		
	31- 35 years	39 (40.6%)	38 (39.6%)	2(2.1%)	17(17.7%)		
	36 – 40 years	19 (51.4%)	12 (32.4%)	0 (0.0%)	6(16.2%)		
	≥41 years	8 (47.1%)	3 (17.6%)	0 (0.0%)	6 (35.3%)		
	<b>Occupation</b>					0.325	13.631
	Civil servant	24 (36.4%)	24 (36.4%)	2 (3.0%)	16 (24.2%)		
	Trader	50 (48.1%)	41 (39.4%)	0 (0.0%)	13 (12.5%)		
	Artisan	26 (44.1%)	18 (30.5%)	1(1.7%)	14 (23.7%)		
	Apprentice	11 (64.7%)	5 (29.4%)	0 (0.0%)	1 (5.9%)		
	Full house wife	12 (48.0%)	9 (36.0%)	0 (0.0%)	4 (16.0%)		



	<b>Educational level</b>					0.515	8.193
	No formal education	8 (53.3%)	6 (40.0%)	0 (0.0%)	1 (6.7%)		
	Primary	16 (59.3%)	9 (33.3%)	0 (0.0%)	2 (7.4%)		
	Secondary	44 (45.8%)	29 (30.2%)	1 (1.0%)	22 (22.9%)		
	Tertiary	55 (41.4%)	53 (39.8%)	2 (1.5%)	23 (17.3%)		
	<b>Ethnicity</b>					0.991	2.005
	Yoruba	82 (45.8%)	65 (36.3%)	2 (1.1%)	30 (16.8%)		
	Igbo	29 (43.3%)	25 (37.3%)	1 (1.5%)	12 (17.9%)		
	Hausa	10 (50.0%)	5 (25.0%)	0 (0.0%)	5 (25.0%)		
	Others(minority)	2 (40.0%)	2 (40.0%)	0 (0.0%)	1 (20.0%)		
	<b>Religion</b>					0.630	4.343
	Christianity	94 (42.9%)	83 (37.9%)	2 (0.9%)	40 (18.3%)		
	Islam	28 (54.9%)	14 (27.5%)	1 (2.0%)	8 (15.7%)		
	Traditional	1 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)		
	<b>Income level</b>					0.237	15.087
	≤ 20000	34 (50.0%)	23 (33.8%)	0 (0.0%)	11 (16.2%)		
	21000-30000	24 (47.1%)	20 (39.2%)	1 (2.0%)	6 (11.8%)		
	31000-40000	16 (41.0%)	12 (30.8%)	0 (0.0%)	6 (11.8%)		
	41000-50000	16 (47.1%)	10 (29.4%)	2 (5.9%)	6 (17.6%)		
	≥51000	33 (41.8%)	32 (40.5%)	0 (0.0%)	14 (17.7%)		

\*Nil treatment- no treatment taking \*\*Conventional management pattern- diagnostic findings, taking quinine, ACT, rest, Fansider, vitamins and bathing/shower \*\*\*Non-conventional pattern only- Alabukun, Herbal mixture, Moringa, Aloe Vera, Bathing and rubbing faith measures(soap, water), Taking anointing oil, Panadol and chloroquine  
\*\*\*\* combined conventional and non-conventional.

The above Table shows that there was a significant relationship between the health facility visited for malaria treatment and pattern of management used by pregnant women, as majority of the pregnant women visited Babcock University Teaching Hospital, Primary Health Care I and II respectively adopted the conventional pattern to other patterns while women visited community health facility and adopted more of non-conventional to conventional. The remaining socio-demographic variables such as age, education, occupation, ethnicity, religion and socio-economic factors had no significant relationship to the pattern of malaria management adopted at  $p > 0.005$ . Similarly, the highest proportion of pregnant women did not use any pattern of management at all as either no malaria cases in pregnancy to treat or decided not to use any of the management patterns.

## DISCUSSION OF FINDINGS

Malaria in pregnancy is prominent in high transmission areas, though it may not manifest signs and symptoms (febrile) like in the children and other age groups thus making it highly dangerous in this group, though preventable and treatable. However, this study aimed at identifying patterns of prevention and management of malaria by pregnant women in Ilisan-



Remo, Ikenne Local Government Area of Ogun State. The findings identified various measures and its frequency of use for management of malaria occurrences in pregnancy and the patterns of management measures adopted by pregnant women.

### **Socio-demographic Characteristics**

The age distribution of pregnant women in this present study conforms to the expected female adulthood production period in life by UNFPA (2019) and WHO (2015) and to countries reproductive women demography (KDHS, 2015; NDHS, 2018). The pregnant women were grouped: majority age ranged between 31-35 years and 26-30 years commensurate with the study findings of Efunshile et al. (2011). Thus showing that the majority of population studied are adulthood and within the gestational and parity ages period that is most safe for reproduction. The women engaged in different activities for living, particularly trading, civil service and artisanry in contrast to the findings of Sabin et al. (2018), Exavery et al. (2014) and Efunshile et al. (2011). This may own up to the level of development that characterized the study setting and its proximity to developed areas likewise reflecting what the women in the study area are originally known (Adamo, 2007). The pregnant women education in this study is contrary to Yaya et al. (2017) as many of them had formal education beyond the primary education and corresponds to the findings of Adebayo, Akinyemi and Cadmus (2015) that reported higher educational levels among the pregnant women which influence their knowledge on malaria prevention. Invariably, this also led to the fact that the setting is richly blessed with infrastructural development (schools – primary, secondary and even university), electricity, road network, which makes it a practically semi-urban setting. Even though the religion beliefs in the area are quite known; Christian, Islam and Tradition, in this study a replica of their beliefs show, but invariably, majority were Christians (Nwomha, Audu & Dickson, 2010). Predominantly, pregnant women in this setting are Yoruba and other tribes such as Hausa, Igbo and Igala. This is further similar to other studies by Adebayo, Akinyemi and Cadmus (2015), Efunshile et al. (2011) conducted in Nigeria particularly, and conversely to many studies conducted outside Nigeria. The women's income level varied, and corroborates the findings of Goshu and Yitayew (2018) and Sabin et al. (2018).

### **Patterns of Management adopted by pregnant women for Malaria prevntion**

The present study identified various measures for management of malaria used to treat and maintain the wellbeing of pregnant women which is in line with Khadivzadeh and Ghabel (2012) and Steketee and Campbel (2018). However, the patterns of measures adopted for malaria in pregnancy differ among pregnant women. In general, the majority of them seldom manage malaria in this pregnancy. This may be as result of not having malaria or no obvious and threatening clinically symptoms or signs, not screened and/or diagnosed of malaria which is contrary to the findings of Chukwuocha et al. (2010) and Adindu (2010). Nevertheless, few pregnant women, less than five-percent, probably had malaria, and were always or often diagnosed either clinically, or laboratory or RDT for malaria in this pregnancy which corroborates the findings of Chukwuocha et al. (2010), WHO (2010), Pell et al. (2016), Ashley and White (2016), and Tagbor, Cairns and Bogang (2015). The malaria measures of quinine were identified amongst the same proportion of pregnant women as always taking for management, and simultaneously 10% claimed they often used it. Chloroquine was identified to have been taken often by very minute pregnant women despite it being a banned drug, and corroborates WHO (2015) and Pell et al. (2016) reports. The measure of Artemisinin Combined Therapy (ACT) was taken always or often by more than 10% pregnant women for malaria in



pregnancy which commensurate the standard protocol of WHO recommendation (FMOH, 2005 & 2014; WHO, 2012 & 2015). However, to some extent some of the measures identified and adopted in this study correspond to the WHO measures for management of malaria in pregnancy as well as the standard pattern of malaria management in the pregnancy. This could be as a result of less probing and study scope. Though alignment to the protocol guideline could be attributed to the presence of health facilities, health personnel in the area and pregnant women exposure. The measures of panadol extra, sulphadoxine pyrimethamine (SP) and medication from patent medicine stores were rarely adopted by the majority but very few often adopted it and is synonymous to Ahorlu, Koram and Weiss' (2017) result findings. Nonetheless, other measures for malaria management like traditional herbs, powder and mixture of herbs, as well as spiritual measures such as oil, water and soap, among others were solidified in their beliefs and often adopted by the very few and conforms to the findings of Deresea and Ali (2016), Pell, Mbachu and Sabin (2016).

### **Factors associated with the patterns of management of malaria in Pregnancy**

In general, studies had determined some factors associated with the patterns of management of malaria in pregnancy as information, knowledge of malaria prevention, previous experiences, recommendation, cost and quality of care, and belief, which were found true in this present study by majority of the pregnant women except for belief in traditional care which was an average. However, some recent studies by Maegan et al. (2010) and Ezebunwa and Nwakocho (2014) conducted both in rural and urban ends conform to the present study results; though none of the factors is significantly associated with the patterns of prevention thus contrast to the studies of Okafor, Oluwole, Onigbogi and Ezekude (2019). Similarly, some factors too were also found to be associated with the patterns of management of malaria in pregnancy adopted as experience, resources, severity, allergy, pregnancy outcome which majority of them also agreed to and quite similar to this present findings. Notwithstanding, some of these factors also notably included ANC facility to be statistically significantly associated with the patterns adopted for management in this present study and conform to the findings of Goshu and Yitayew (2019) and Rumisha et al. (2014) that reported educational status and knowledge of malaria respectively.

## **SUMMARY, CONCLUSION AND RECOMMENDATION**

### **Summary**

Malaria in pregnancy is a treatable ailment, yet remains holo-endemic among pregnant women. However, it is predominant in high transmission areas and often affect the maternal-foetal exchange thereby causing low birth weight, still births, abortions, preterm, failure to thrive in infants; and in pregnant women, anemia, miscarriage and other related complications (shock and death) (WHO & Bekele, 2016). Notwithstanding, several concerted efforts directed towards control of malaria using different measures, in which its patterns of adoption varied. Therefore, this study identified patterns of management of malaria by pregnant women in Ilishan-Remo, Ikenne Local Government Area, Ogun State. Review of literature was done on the conceptual, empirical and theoretical for the patterns of management of malaria in pregnancy.



A cross-sectional survey design was used and a sample of 271 proportionate consented pregnant women were purposely selected in four ANC health care facilities, Ilishan-Remo. A self-administered questionnaire used to collect data on socio-demographic patterns of prevention and management, and factors associated with prevention and management of malaria in pregnancy. The instrument was pre-tested among 27 pregnant women at ANC facility, PHC Ward Five in Iperu-Remo. Administered instrument was valid and reliable after analysis for reliability with Cronbach's alpha coefficient score of 0.78, 0.74, 0.69 as well as face and content validity fulfilled. Data collected from pregnant women at ANC facilities on the ANC clinic days and retrieved for statistical analysis with SPSS version 23 for descriptive and tested hypotheses using chi-square at  $p\text{-value} \leq 0.05$ .

Conventional patterns of management used by majority and influenced by health facilities as well as combination of both conventional and non-conventional was also common in this study. Hence, there is still a need to sensitize pregnant women to follow standard FMOH/WHO and conventional patterns of prevention and management of malaria.

## CONCLUSION

Generally, pregnant women are at higher risk of contracting malaria than other vulnerable groups due to the physiological changes of hemo-dilution, immune and hormonal changes which make them more liable and susceptible to malaria. A mosquito bite in pregnant women could be dangerous and concomitantly affects the in-utero as the majority may not manifest the signs and symptoms that might prompt instant care especially in high transmission areas. Thus, it is expedient for pregnant women to register and visit antenatal care facilities at all scheduled periods for adequate care like malaria in pregnancy. Pregnant women adopted different patterns of management for malaria by using various measures at different rates which include herbs, ACT, spiritual homes, water, oil, soap and other procured medicines from patent stores.

## Recommendations

Based on the findings from this study, the researcher recommended the following;

1. There is a need for midwives to encourage pregnant women to register and visit antenatal care facilities at all scheduled periods for adequate care such as prevention and management of malaria in pregnancy.
2. Pregnant women should be educated about malaria, its prevention and management methods to seek protection of themselves and their babies.

## Suggestion for Further Studies

The researcher suggested the following based on the findings from the study and the need to cover more grounds:

1. The scope of the research can be increased by other researchers for more generalization of the findings.
2. Other researchers can explore how pregnant women used the selected patterns of prevention and management of malaria in pregnancy.



3. The research would also suggest a qualitative method of approach for this study and as well a comparative study to ascertain the true relationship between the settings and its associated and socio-economic factors that might be influencing patterns of management of malaria in pregnancy.
4. The research would also suggest that the limitation to orthodox areas would not reflect a situation of pattern as introduced bias, rather a total community based study to include all ANC facilities both orthodox and alternative care that pregnant women patronize in a given setting of study.

### **Limitation of the study**

1. Some of the participants were initially reluctant in participating in the study thinking much of their time would be taken.
2. The study is limited to quantitative approach design.
3. The study scope is mainly within the public government ANC facilities and faith-based tertiary health facilities.
4. The time-frame delimit the study for being a robust and extensive study and as well the Covid-19 pandemics which affected the regular routine of essential healthcare services activities, thus reducing the pregnant women visiting the ANC scheduled.

### **Nursing Implication of the study**

#### **Nursing practice**

Nurses and midwives, even other health attendants within the community, should intensify health education on the preventive measures and management of malaria among pregnant women within the community. They should be encouraged to take WHO malaria preventive and management measures during pregnancy.

#### **Nursing Education**

All nurses in the community should continually undergo some educational training on prevention and management of malaria in pregnancy as this will help in the management of malaria pregnancy to the recommended standard by WHO.

#### **Nursing Administration**

Based on the findings of this study, it is quite useful for policies and plans development to sensitize pregnant women to make use of WHO patterns of malaria management during pregnancy and also the administration of the regimen as stipulated. Furthermore, it is equally useful for midwives and other health practitioners to update their knowledge about current management of malaria in pregnancy.

#### **Nursing Research**

More research studies related to patterns of prevention and management of malaria in pregnancy should be considered.





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