DETERMINANTS AND UTILIZATION OF MALARIA PREVENTIVE COMMODITIES AMONG WOMEN ATTENDING ANTE NATAL CARE IN ASA LOCAL GOVERNMENT AREA OF KWARA STATE, NIGERIA.

By

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Certification

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Dedication

I dedicate this project to God Almighty and to all humanity.

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Finally, I would say bravo! To me for the time created to type this manuscript.

ABSTRACT

Introduction; Malaria causes variety of adverse consequences in pregnant women due to invasion of the placenta by Plasmodium spp. Malaria increases the risk of adverse pregnancy outcome for the mother, the foetus and the new-born. Pregnant women are susceptible to episodes of severe malaria, which can result in stillbirths, spontaneous abortion and maternal death. Pregnant women constitute a significant proportion of Nigeria population and are vulnerable to malaria infection; they are ignorant and have limited access to health care services and malaria preventive commodities. The study assessed utilization of malaria preventive commodities among women attending ANC, in Asa LGA of Kwara state.

Methods; The Study was carried out in Asa LGA of kwara state, the LGA has a population of about 200,000. Descriptive cross section study was used for study design and study population were pregnant women, all pregnant women who were permanent residents and attending ANC were included except those that present with complications and obstetrics emergency. Sample size calculated was 402 and multistage sampling technique was used and semi-structured interviewer administer questionnaire was used for data collection. Ethical clearance was obtained from Kwara state ministry of Health and permission was given by Chairman Asa LGA and verbal and written informed consent was obtained from each of the participants before questionnaire was administered.

Results; Four hundred and two questionnaires was administered to pregnant women with Mean Age of 29.64±6.45. Two hundred and eighty three (70.4%) were Muslim, 243(60.4%) were Yoruba and 166(41.3%) had secondary education. Major occupation of respondents was trading, 185 of them comes from extended family and 306(76.1%) were married. 23.9% has good knowledge about malaria preventives commodities and 43.1% has positive attitudes towards malaria preventives commodities.

Conclusion; It can be concluded from this study that knowledge and attitude of the pregnant women affects utilization of malaria preventives commodities and heat was the major factor why some women refused to use LLIN. Other factors that affect utilization of various form of malaria preventives commodities were availability and affordability.

Recommendations; Health workers in the LGA should organize health education workshop that will be targeted towards malaria prevention in pregnancy, State government should embark on mass distribution campaign LLIN and other forms of malaria prevention commodities should be make available and affordable. Non-governmental organization should support the state government in making malaria preventives commodities available.

Keywords: Malaria preventives commodities, Utilization, Ante Natal Care.

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LIST OF ABBREVATIONS

ACT	Artemisinin- based Combination Therapy
AIDS	Acquire immune deficiency syndrome
ANC	Ante natal care
DOT	Directly Obverse treatment
FANC	Focus ante natal care
HIV	Human+ Immune Virus
INT	Insecticides treated nets
IPT	Intermittent preventive treatment
IRS	Indoor Residual Spray
LGA	Local Government Area
LLIN	Long Lasting Insecticides treated nets
PHC	Primary health Care
SP	Sulphadoxine pyrmethamine
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background

Malaria causes variety of adverse consequences in pregnant women due to invasion of the placenta by Plasmodium (Fuge and Ayanto 2015). Malaria increases the risk of adverse pregnancy outcome for the mother, the foetus and the new-born. Knowledge, attitudes and practices of this vulnerable groups about malaria and the effective use of insecticide-treated nets (LLINS) contribute to sustainable control of the disease and its effects (Fuge and Ayanto 2015). Malaria infection during pregnancy is an enormous public health problem, in areas of low transmission of *Plasmodium falciparum*, where levels of acquired immunity are low, pregnant women are susceptible to episodes of severe malaria (World Health Organization 2007), which can result in stillbirths or spontaneous abortion or in the death of the mother. In areas of high transmission of *P. falciparum*, where levels of acquired immunity tend to be high, women are susceptible to asymptomatic infection, which can result in maternal anemias and placental parasitaemia, both of which can subsequently lead to low birth weight.

Malaria remains a significant, debilitating and often lethal disease in many parts of the world although its incidence, severity and impact is highly regional-dependent (Dambhare et al. 2012) . Worldwide malaria has been rated as one of the most important health problems facing communities(Batega 2004) . Malaria causes 216 million cases and an estimated 655000 deaths in 2010 in the world and about 80.5% of the 109 billion populations of the world live in malaria risk areas. Malaria affects the health and wealth of nations and individuals alike. Approximately 300 million people worldwide are affected by malaria and between 1 and 1.5 million people die every year due to malaria (Akaba et al. 2013).

In Africa malaria is understood to be both a disease of poverty and a cause of poverty. Annual economic growth in countries with high malaria transmission has been lower than in countries without malaria. Economists believe that malaria is responsible for a 'growth penalty' of up to 1.3% per year in some African countries (Debela et. al. 2014). Malaria is the most prevalent parasitic endemic disease in Africa, which is preventable, treatable and curable, yet it remains one of the major causes of death and disability in children under five in the country and it also causes maternal morbidity and mortality. Today malaria is found throughout the tropical and

sub-tropical regions of the world and causes more than 300 to 500 million acute illness and at least one million deaths annually (Ayodeji, Adebayoland Akinyemi 2015). Malaria is caused by four species of *Plasmodium* and is increasingly becoming a serious burden in most tropical countries and a major cause of death in children in sub-Saharan Africa. In endemic regions of sub-Saharan Africa, malaria during pregnancy (Malaria in pregnancy) is a major preventable cause of maternal and infant morbidity and mortality. Current recommended Malaria in pregnancy prevention and control includes intermittent preventive treatment (IPTp), distribution of insecticide-treated bed nets (LLINS) and appropriate case management(Idowu and Mafiana, 2007).

The World Health Organization has recommended priority interventions for malaria during pregnancy, including use of insecticide-treated nets (LLINS), but net distribution has shifted recently to a universal coverage paradigm rather than one targeting vulnerable populations (Chinyere, Wellinton and Rose 2009). Intermittent preventive treatment of malaria in pregnancy (IPTp) using sulphurdoxine-pyrimethamine (SP) is one of the key malaria control strategies in Africa. Yet, IPTp coverage rates across Africa are still low due to several demand and supply constraints. Many countries implement the IPTp-SP strategy at antenatal care (ANC) clinics (Mubyazi and Bloch).

About 70% of Nepal's populations live in areas with unstable malaria transmission. In 2001, out of 23.2 million population of the country, 16.5 million are at malaria risk in Nepal. Malaria remains uncontrolled due to emergence of the drug resistant parasite, insecticide resistant mosquito vector and non-availability of suitable and effective malaria vaccine (Pell C et al 2013).

In Ethiopia, malaria is at the forefront among the health problems of the country. The actual number of malaria cases that occur annually throughout the country were estimated to be about 4-5million. Due to climatic and geographic factors, the disease occurs in different parts of the country in epidemic form. About 75% of the total area of the country is estimated to be malarious (Nwagha et al,2014.). Pregnant women are not well aware of the multi-dimensional challenges of malaria in Ethiopia.

In Malawi and Kenya, LLINS were generally recognized as important for malaria prevention, but there were complaints about it availability. In central Ghana, women saved LLINS until the

birth of the child and they were used seasonally in northern Ghana. Although LLINS were valued as malaria prevention, health messages could address issues that reduce their uses during pregnancy. In Kenya and central Ghana, pregnant women did not associate IPTp with malaria (Irene et al. 2010), whereas, in Malawi and northern Ghana, IPTp was linked to malaria, but not always with prevention (Ricotta and Koenker 2014). IPTp adherence was common at all sites, whether delivered with directly observed treatment or not, a few women did not comply with IPTp due to previous side effects. The impact of previous side effects on adherence to IPTp and anti-malarial treatment regimen during pregnancy requires attention. Overtreatment of Malaria in pregnancy highlights the need to monitor the implementation of Malaria in pregnancy case management guidelines.

Malaria situation in Nigeria is deteriorating and obstacles to the success of interventions are socio-cultural, economic and political in nature. The malaria preventive behaviours among pregnant women were found to be generally poor across the six geo-political zones in Nigeria. The disease burden is increasing in almost all the tropical countries since malaria creates socioeconomic problems and also leads to large number of deaths, particularly among young children and pregnant women (Ayodeji and Akinyemi 2015).

Intermittent preventive treatment for prevention of malaria in pregnancy (IPTp) using sulphadoxine-pyrimethamine (SP) through focused antenatal care (FANC) and using direct-observed therapy (DOT) is a key component of malaria control strategy among pregnant women in Nigeria. Despite the evidence of the effectiveness of this strategy in reducing the adverse effects of malaria during pregnancy, the coverage of the programme in Nigeria is low (Iriemenam , Dosunmu and Oyibo)

To reduce the risks of pregnant women getting malaria in Nigeria, the current policy under the National Malaria Control Programme calls for all pregnant women to receive at least two doses of sulphadoxine-pyrimethamine (SP/Fansidar). Women receive SP/Fansidar during their antenatal care visits under directly observed therapy. It is also possible that pregnant women obtain SP/Fansidar from sources outside of antenatal care visits.

Integrated vector management (IVM), which includes the use of ITNs, indoor residual spraying (IRS), and environmental management, is a part of the multi-pronged strategies for malaria control among pregnant women in Nigeria. Several interventions have targeted specific areas

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within states, or throughout selected states, to distribute ITNs and long-lasting insecticidal nets (LLINs) for pregnant women and children under age 5. Nigeria adopted two strategies for the deployment of LLINs in the 2009-2013 'catch-up' and 'keep up' distribution campaign. The catch-up phase of the distribution is aimed at rapidly scaling up ownership of the nets through mass LLIN campaigns for universal coverage, and the keep-up phase is to maintain the coverage attained during the catch up through routine distribution of LLINs.

1.2 Problem Statement

Malaria causes over 207 million clinical cases and ~627,000 deaths worldwide every year representing an enormous global, social and economic burden (Batega 2004). Prevalence of malaria in pregnancy ranged between 15-55.4% among ANC Attendees while the prevalence of severe anemia during pregnancy was 18% (Mbonye and Bygbjerg 2016). Malaria during pregnancy is responsible for 5–12% of all low birth weight and 35% of preventable low birth weight and it contributes 75,000 to 200,000 infant deaths each year(World Health Organization 2007). Malaria related problems in pregnancy include miscarriages, malaise, anemia, back and joint pains, labour complications, maternal and child death. Other problems were low birth weight, Intra uterine growth retardation (IUGR), premature rupture of membrane (PROM), Intra uterine fetal death (IUFD) and still birth (Mangeni 2003).

In Africa where malaria is endemic, malaria directly contributes to 25% of all maternal deaths. Malaria in pregnancy contributes to perinatal morbidity and mortality. Malaria infection is known to cause higher rates of miscarriage, intrauterine demise, premature delivery, low-birth-weight neonates, and neonatal death. Understanding how malaria specifically affects pregnant women in Africa is crucial to improve maternal and perinatal health and curb the spread of this preventable infectious disease.

In Uganda of 2,316 pregnant women were observed for malaria related outcomes; still births (3.4%) with incidence highest in Northern and Central Uganda; abortion (4.2%) with incidence highest in western and central Uganda; and low birth weight < 2.5 kg (12.3%) with incidence highest in northern Uganda (22.4%) and among teenagers (Mbonye and Bygbjerg, 2016). In Mozambique 10% of maternal deaths were directly attributed to malarial infection and 13%

were secondary to human immunodeficiency virus (HIV)/AIDS, which can be exacerbated by coexisting malarial infection.

Malaria is a major problem among pregnant women in Nigeria; it causes severe anemia and maternal death. Malaria further diminishes immunity in pregnancy; Malaria in pregnancy, contribute to roughly 11% of neonatal deaths and about 25% of all maternal deaths. Malaria disease occurs throughout the year and more common in the rural areas among pregnant women. Malaria preventives commodities are LLIN, IPT, Indoor sprays with insecticides. One of the main reasons for non-use sage of LLINs among pregnant women was unaffordability of LLIN hence uses of LLIN to prevent malaria in pregnancy in Nigeria are low. Malaria-related deaths account for up to 11 percent of maternal mortality. Additionally, they contribute up to 25 percent of infant mortality and 30 percent of under-5 mortality, resulting in about 300,000 childhood deaths annually.

1.3 Justification

Pregnant women constitute a significant proportion of Nigeria population this group of people are vulnerable to malaria infection, they are often ignorant and they have limited access to health care services. The information on malaria prevention and control to pregnant women in Nigeria is usually inadequate and often inaccurate (Erhun et al. 2005). There are gaps on the knowledge of pregnant women and malaria preventives commodities.

Moreover, majority of the pregnant women belong to the low socio economic status which limited them to accurate and adequate information. The traditional healer resides or lives in most of our rural communities which make majority of pregnant women vulnerable to traditional medicine because of easy access to the traditional healers (Ayodeji and Akinyemi2 2015). The cost of orthodox medicine and malaria preventives commodities; and non-availability and accessibility to health personnel and facility makes majority of them vulnerable. Most pregnant women have relatively low level of knowledge about the severity and risks of malaria in pregnancy, and most of them do not have access to malaria preventives commodities.

Pregnant women are 3 times more likely to suffer from severe disease as a result of malarial infection compared with their non-pregnant counterparts and they have a mortality rate that

approaches 50%. Prevention of malaria in pregnancy will reduce maternal morbidity and mortality. Prevalence, incidence and overall burden of malaria will be reduced with improvement on malaria prevention among pregnant women. Prevention of malaria in pregnancy improves family savings by reducing cost of treatment.

This study aimed at improving pregnant women knowledge on malaria preventives commodities and findings from this study may serve as a basis for further research. This study aimed at facilitating planning and resource allocation to malaria preventives commodities among other health needs. It may indicate direction for further research, baseline information to design intervention and improving an existing intervention. it may also serve as tools for advocacy among policy makers.

Nigeria bears up to 25 percent of the malarial disease burden in Africa, hence contributing Significantly to the one million lives lost per year in the region, which mostly consists of children and pregnant women. Malaria in Nigeria is endemic and constitutes a major public health problem despite the curable nature of the disease. The disease overburdens the already-weakened health system: nearly 110 million clinical cases of malaria are diagnosed each year, and malaria contributes up to 60 percent of outpatient visits and 30 percent of admissions. Malaria also exerts a huge social and economic burden on families, communities, and the country at large, causing an annual loss of about 132 billion Naira in payments for treatment and prevention as well as hours not worked (Jimoh et al).

Immunocompromised patients to malaria like pregnant women, children, travelers to malaria endemic regions, and persons with coexisting HIV infection are at highest risk for malaria morbidity and mortality. In addition to loss of life, malaria places an economic burden on African nations. It was estimated that malaria costs Africa US$12 billion per year in direct costs and reduces GDP growth by 1.3 percent annually. The burden is carried mostly by the poor and rural families that have less access to current prevention and treatment services. Despite the devastation caused by malaria, increased international attention and funding for prevention and treatment is saving lives. Due to appropriate prevention and treatment malaria incidence has reduced by 30% globally and 34% in Africa and malaria mortality decreased by 47% worldwide and 54% in Africa.

This study will be useful to the pregnant women, community and policy makers in formulating adequate and correct policy in prevention and control of malaria among pregnant women.

1.4 Research questions

I. Does knowledge of pregnant women affects utilization of malaria preventives commodities?

II. How does attitude of pregnant women affect utilization of malaria preventives commodities?

III. What factors affects utilization of malaria preventives commodities among pregnant women?

1.5 Aims and Objectives

1.5.1 Aims

To assess utilization of malaria preventive commodities among women attending ANC, in Asa LGA of Kwara state.

1.5.2 Specific Objectives

1. To determine the knowledge of pregnant women on utilization of malaria preventive commodities in Asa LGA
2. To determine the attitude of pregnant women in Asa LGA towards utilization of malaria preventive commodities
3. To identify factors that affect utilization of malaria preventives commodities among pregnant women in Asa LGA

1.6 Working Definition of Malaria Preventives Commodities

Malaria preventives commodities is refers to various ways by which malaria is prevented among women attending ante natal in the community which includes; Insecticides treated nets (ITN), Sulphadoxine-pyrimethamine (fansidar), clearing of busy, clearing of drainage, indoor residual spray, wearing of long dresses (trousers, long sleeves shirt) and insects repellants.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Knowledge of Pregnant women on malaria transmission, signs and symptoms

About 84.7% of the world population had fair knowledge about malaria disease and 8.6% were aware of the causative agent (Dambhare et al. 2012). Transmission of malaria by mosquito bite was known to 69.8% of the pregnant women and this was found significantly associated with male gender (X2 = 4.21, p = 0.03). Some of the pregnant women had misconception regarding the mode of transmission of malaria for example houseflies (32.8%). Nearly half (51.1%) of the pregnant women had knowledge of symptoms of malaria as fever. Majority of the pregnant women (57.7%) knew commonest breeding habits of mosquitoes as dirty stagnant water (Manual et al. 2003).

In Africa the main source of information about malaria disease to most of the pregnant women were television and radio (51.7%). About 47.4% of the pregnant women knew that prevention of breeding places of the mosquitoes by cleaning the surrounding reduces malaria disease in pregnancy(Fellow 2013). Ethiopian national malaria indicator survey of 2007 indicated that about 71.0% of the rural community and 80.5% of the urban community have knowledge about malaria. However, only 30.1% of the rural and 59.7% of urban community knew that mosquito bites transmit malaria.

In a sturdy carried out in 2008 on bednet Use and Malaria Knowledge in Zaria City, Nigeria, it was found that Six hundred and twenty seven (72.6%) of the study participants mentioned stagnant water as breeding sites for mosquitoes and only two hundred and seventy nine (32.3%) of study participants knew that Anopheles mosquitoes are responsible for the transmission of malaria (Elisha, Renne and Kelly, 2008). Four hundred and fifty (48%) had reported that mosquito bites mostly at night and only 14 (1.6%) of the respondents knew that malaria is caused by microscopic organisms (plasmodium species). The three most common misconceptions of study participants about causes of malaria were exposure to cold weather 219 (25.3%), hunger 135 (15.6%), drinking dirty water 127 (14.7%). Also mentioned were eating corn 27 (3.1%), sleeping with malaria patients 20 (2.3%) and due to evil spirit 10 (1.2%) as causes of malaria.

In a study carried out on Knowledge and utilization of malaria preventive measures among pregnant women in a tertiary hospital in Nigeria it was found that three commonly mentioned manifestations of malaria were feeling cold and rigor 557 (64.5%), fever 325 (37.5%) and headache 317 (36.7%) (Akaka et al. 2013). The study indicated that the loss of consciousness, seizure and vomiting were mentioned by 28.1%, 24.4%, and 16.0% of study participants as major manifestations of severe malaria (Akaba et al. 2013).

In an experimental study carried out in Nigeria by (Idowu and Mafiana, 2007) on malaria in pregnancy: Knowledge, attitude and practices of pregnant women in Abeokuta, Nigeria results showed that during the pre-intervention period, 69.4% of the pregnant women in experimental group attributed the cause of malaria to mosquito bites, while the others had incorrect responses ranging from excessive sunlight (18.5%) dirty environment (8.1%) and eating of bad food (4.0%)(Or et al. 2002). After the intervention, the proportion of pregnant women in the experimental group who had correct knowledge of aetiology of malaria increased significantly to 100% (that is none of them had incorrect knowledge of malaria causation). Among the controls, there was no difference in the pre and post intervention proportions of the respondents' knowledge of malaria aetiology.

In another study in Nigeria 78.9% of the pregnant women responded correctly to the cause of malaria which was attributed to mosquito bites and 86.0% of the pregnant women responded correctly to its breeding sites (Ayodeji and Akinyemi 2015). Prior to their first ANC visits, 16.0% of the pregnant women had no knowledge of the cause of malaria, and 10.9% ascribed it to working under the direct rays of the sun for so long. Furthermore, 6.6% of the pregnant women had no knowledge of breeding site of mosquitoes. At 1–2 months before delivery, only 1.1 and 0.3% of the pregnant women failed to commit to memory the cause of malaria and its breeding site, respectively. Results revealed no association between malaria infection and the level of the pregnant women's education (Amoran 2013). However, an association between malaria infection and occupation indicating that malaria infection is related to the degree of exposure to infected mosquitoes ($\chi^2 = 13.797$, df = 6, $p = 0.032$).

In a study carried out by (Chibuzor TO, 2013) on prevalence of malaria in Pregnancy among mothers. A case study of Ebonyi State University Teaching Hospital. A total of 297 women (mean age=29±6.8 years) were involved. Seventy percent of the women had attained primary

school education. Most (71.4%) women had average knowledge on malaria while only eight percent of them had good knowledge on malaria in pregnancy. Knowledge on malaria in pregnancy had a significant association with levels of education (p=0.024).

In another study 74.3 % of the pregnant women had good knowledge about malaria symptoms and only 15.6 % of the pregnant women associated mosquitoes with malaria. Majority of pregnant women (65.6 %) responded that malaria is transmitted due to poor personal hygiene and environmental sanitation.

Malaria in pregnancy is a major public health concern, contributing to roughly 11% of neonatal deaths and to 25% of all maternal deaths in some parts of the world (Chinyere, Wellinton and Rose, 2009). In another study on knowledge of pregnant women regarding causes, transmission, and prevention of malaria results indicated that 66.3%, 50.8% and 64.8% of the study participants had been regarded as knowledgeable about causes and transmission, clinical manifestations, and prevention of malaria, respectively. Most of the pregnant women (> 60%) were familiar with signs/symptoms associated with malaria as defined by western medicine; 68.3%, 67.4%, 61.8%, 19.6%, 10.0% and 4.3% of respondents reported fever, headache, body pains, dizziness, vomiting and diarrhea respectively, as common symptoms of malaria (Dambhare et al., 2012).

Study on knowledge, attitude, perception and evaluation of malaria parasitaemia among women attending antenatal care clinic in Lagos, Nigeria. Malaria prevalence was 6.7% and 5.3% in peripheral and placental blood respectively. Overall, 59.0% women took at least two IPTp-SP doses which was associated with 50% reduction of Plasmodium; (P.) falciparum infection in primigravidae. Previous malaria treatment was a risk factor for peripheral P. falciparum infection, while uptake of IPTp-SP was associated with reduced parasitaemia. Anemias prevalence was 38.0%, low birth weight and prematurity rates were 6.0 and 12.0% respectively. Young age was associated with a higher frequency of malaria, anemias, low birth weight and preterm delivery (p<0.01). Birth weight significantly rose with increasing age (p<0.01), parity (p=0.03) and number of SP doses (p=0.03). A birth weight reduction of 230 g in case of peripheral parasitaemia (p=0.02) and of 210 g with placental parasitaemia (p=0.13) was observed (Ibeneme, Ibeanusi and Oyibo, 2011).

In a study on microscopic Plasmodium Falciparum infection prevelance during pregnancy following IPT-SP implementation in urban cities of Gabon, microscopic P. falciparum prevalence during pregnancy significantly declined between 2005 and 2011, following IPTp-SP implementation. Young women and paucigravidae remain the most susceptible to malaria and associated outcomes (Bouyou-Akotet et al.,).

2.1.1 Knowledge of Pregnant women on malaria preventive commodities

2.1.1a long lasting insecticides treated nets (LLIN)

Study on Knowledge , Attitude and Practice in the Community towards Malaria Prevention in Ethiopia showed that 52.7% of pregnant women and 51.8% of children have used LLIN (Aderaw and Gedefaw, 2013). In a study in Lagos, minority of pregnant women knew that long lasting insecticide-treated bed nets (LLINS) is a way to prevent malaria in pregnancy but complained of its high cost. In another study in Nigeria none of the pregnant women were aware about the new strategy of insecticide treated bed nets (Juliana et al, 2009). In another study the proportions of the pregnant women with different knowledge of malaria prevention methods were compared, in experimental group, the proportion of those using LLIN increased from 60.8% to 97.4% ($P < 0.001$). Ninety-eight percent had an LLIN, mostly (87.1%) received free from the government. A total of 398 pregnant women participated in the study and their overall knowledge and attitude towards malaria and LLINS was fairly good. When asked to cite specific ways to avoid getting malaria, 62 percent of women say sleeping under a mosquito net. The percentage of women who mention sleeping under a mosquito net as a way to avoid malaria varies greatly among zones, ranging from 90 percent in South West to 38 percent in North East. Seventy-five percent of women living in areas with the World Bank Booster campaign say that sleeping under a mosquito net is a way to avoid getting malaria, compared with 60 percent of women in other net campaign areas, and 56 percent of women in areas with no net campaign. Fifty-eight percent of women report that sleeping under a mosquito net helps pregnant women in preventing malaria (Onwujekwe, Hoshen, and Sofola, 2005).

2.1.1b intermittent preventive treatment (IPT)

Study on awareness of anti malaria policy and use of artemisinin-based combinantion therapy for malaria treatment in two selected Local Government Area of Ogun state, Nigeria. Majority of pregnant women were aware of the IPTp-SP strategy's existence and were aware of the recommended three tablets after quicken and one month spacing of administration of SP doses(Adeneye and Jegede, 2014). Some pregnant women were unsure that it is not recommended to administer IPTp-SP and ferrous/folic acid concurrently. Pregnant women often register at clinics late and some do not comply with the regularity of appointments for revisits, hence Miss IPTp and other ANC services. Pregnant women also noted some amplified rumours among clients regarding health risks and treatment failures of SP used during pregnancy, and together with clients' disappointment with waiting times and the sharing of cups at ANC clinics for SP, limit the uptake of IPTp-doses (Mubyazi and Bloch, 2014).

A significant proportion of women were not aware of the reasons for taking SP during pregnancy (35%), timing for SP (18%), and the effect of malaria on pregnancy (45.8%). Timing for first dose of SP for intermittent preventive treatment in pregnancy (IPTp) was 1-3 months (28.4%) and 4-6 months (36.8%). Some 78.1% were provided with SP under supervision of the health provider. The coverage of IPTI was 53.5% and IPTp2 was 41.1%. The proportion of women making more ANC visits decreased with increasing parity (Mens et al. 2011). In another study 22 percent of pregnant women said taking SP/Fansidar is part of antenatal care and way pregnant women can avoid getting malaria.

2.1.1c Indoor residual Sprays (IRS)

There was improvement in knowledge of indoor spraying which increased from 14.7% to 58.2% ($P < 0.001$) and knowledge of window and door nets, which increased from 48.3% to 74.8% ($P < 0.001$) (Adeneye and Jegede, 2014). While those with knowledge of maintaining clean environment also increased from 50.4% to 64.5% ($P < 0.001$). Study in Nigeria by (Erhun, Agbani and Adeyanju, 2005) it was found reported that good sanitary measures and the use of mosquito coils/insecticide spraying became the choice of most pregnant women in preventing malaria. Study on the level of knowledge and utilization of indoor residual spray (IRS) among pregnant women, from the total pregnant women sampled, only 5.17% believed

that malaria can be prevented using IRS. They were also asked whether indoor chemical spray was performed for their house, and whether their house was plastered after indoor chemical spray (Nwagha et al, 2014). Of the total pregnant women 369 (42.7%) reported that indoor chemical spray was carried out within 24 months (mean 2.68 months) before data collection, while 104 (12.03%) of study participants reported that their house was plastered or painted after indoor chemical spray within the last 24 months (Nwagha et al 2014). Other responses include keeping the surroundings clean (31 percent), using mosquito coils (26 percent), using insecticide spray (20 percent), keeping the doors and windows closed (13 percent), eliminating stagnant water around living areas (8 percent), cutting the grass (7 percent), and using insect repellent (3 percent), while 28 percent say keeping the environment clean (Nwagha et al, 2014).

2.1.2 Knowledge of Pregnant women on malaria treatment

Use of drugs and traditional herbs for malaria prophylaxis and treatment in pregnancy reduced from 42.0% to 20.0% ($P < 0.001$) and 17.0% to 27.3% ($P < 0.001$(Juliana et al, 2009)), respectively. There were no significant improvements for use of mosquito coil ($P < 0.01$) and about 12.1% pregnant women had taken self-medication during pregnancy. The health-seeking behavior and the knowledge of malaria prevention among women attending ANC in Lagos were reported, self-medication decreased significantly from 10.9 to 4.3% by 1–2 months before delivery, use of old drugs tablets decreased significantly from 3.1 to 1.4%. Visiting a health Centre increased from 35.4 to 43.3% although it was not significant. Other treatment source options decreased but were not statistically significant with the exception of the use of traditional medicine (Agbo). Traditional concoctions were the preferred options for most of the pregnant women at the first trimester (stage) of the pregnancy. In a study conducted at Yewa LGA of Ogun state only 23.0% of pregnant women knew about ACT drugs. About 48.0% preferred analgesics over ACT drugs (0.6%) for malaria treatment in pregnancy. Lack of awareness and knowledge was the major reason for non-use of ACT drugs (86.1%). Communities in Yewa North had more supplies of ACT drugs and knew more about ACT than those in Ijebu North (Adeneye, Ilegede and Male, 2014).

2.2 Attitudes of pregnant women towards malaria prevention practices

Some mothers have a negative opinion on treatment of malaria during pregnancy. A survey conducted in 17 districts of Uganda indicates that 30.0% of the women studied had a perception that fever is part and parcel of pregnancy, and that some anti-malarial drugs are very dangerous to the foetus (Mufubenga et al, 2001). A later study in Mubende district has also indicated that a good number of women studied considered IPT as a good measure to prevent malaria during pregnancy(Mufubenga 2004). However some considered SP to be very strong and likely to cause miscarriage, kill the mother or make her very weak. Such pregnant women thought that it was not wise to take SP for malaria in pregnancy (Aderaw and Gedefaw 2013) and SP was perceived to be too strong for treatment of malaria in pregnancy.

In a study on attitude of pregnant women towards malaria prevention 78.1%, 69.0%, and 47.1% of the study participants were considered as having positive attitude towards malaria prevention, treatment and malaria prevention practices respectively (Adeneye, Jegede and Nwokocha 2014). In another study, attitude to malaria prevention pre-and post-intervention, of the experimental group shows that there were no improvement in the proportion of those who were of opinion that malaria could not be prevented ($P = 0.76$). Prior to the intervention programme, 90.7% of respondents in experimental group and 88.4% in control group were of opinion that it was possible to prevent malaria in pregnancy. These views did not change even after the intervention programme, which did not produce any statistically significant difference both in experimental and control group (Dambhare et al. 2012)

A qualitative study indicated that several pregnant women perceive mild fever (malaria) and general weakness as a normal sign of pregnancy, but they also recognize that severe malaria can be fatal in pregnant women(Erhun, Agbani and Adesanya, 2005. The majority of respondents associated malaria with mosquitoes both in pregnant and non-pregnant people. However, some respondents perceived malaria to be sexually transmitted or to be caused by the foetus in the womb (Erhun, Agbani and Adesanya, 2005. Whereas mild fever was perceived as a normal sign of pregnancy, which would heal by itself, severe malaria was recognized as a dangerous illness that can lead to miscarriages, premature delivery, stillbirths or the eventual death of a baby.

In another study on Knowledge of malaria prevention among pregnant women and female caregivers of under-five children in rural south-westen, Nigeria 51.1 % had a positive attitude (Ayodeji, Adebayol, Oluwaseun and Akinyemi, 2015). Younger age, receiving information and information obtained from health extension workers and media were found to be important predictors of pregnant women's attitude ($P<0.05$). However, a study by (Mangeni and Mufubenga, 2004) reveals that a good number of pregnant women and mothers studied perceived that fever during pregnancy was dangerous although some incorrectly believed that fever during pregnancy was a normal thing and nothing should be done about it.

2.3 Malaria prevention practices among pregnant women

In study carried out in India by (Dambhare, Nimgade and Dudhe, 2012) on Knowledge , Attitude and Practice of Malaria Transmission and Its Prevention among the School Going Pregnant womens in Wardha District , Central India the results indicated that over 90.0% of the pregnant women who had being infected with malaria disease at least once in the last one year practiced self-medication. Their responses to malaria prevention were, (73.5%) of the them were willing to go to the hospital in the event of malaria attack, to use untreated bed nets (81.2%), insecticides sprays (72.4%) and insecticide treated nets (88.7%) as preventive measures (Dambhare et al., 2012).

2.3.1 Anti malaria drugs

Different treatments modalities used by respondents were 35.5%, 0.9% and 13.4% of pregnant women will use anti -malarias, consult a herbalist or use local herbs, respectively, while 27.3%, 1.7% and 18.2% will go to the hospital, take spiritual/ritual waters for cure or just pray, respectively and 3.0% of the them indicating that they will ignore the signs (Lauren, Pinault and Fiona,2011). Factors influencing pregnant women choice of malaria treatment and preventive methods include cost (22.7%), religious beliefs (5.4%), perceived safety (20.8%), convenience (26.5%) and respondents' state of health (24.6%) (Batega, 2004). In line with World Health Organization recommendation (WHO), the Federal Ministry of Health (FMOH) in 2010 initiated a policy stipulating a comprehensive strategy to control malaria during pregnancy. Under this policy all asymptomatic pregnant women should receive 2 doses of SP

as an Intermittent Presumptive Treatment (IPT), while mothers with malaria signs and symptoms get effective case management according to national guidelines (FMOH, 2010).

2.3.2 Long lasting insecticides treated nets (LLIN)

The malaria prevention practices of the pregnant women utilizing different malaria prevention practices were compared. In the experimental group, the proportion of those with LLIN use increased from 50.8% to 87.4% ($P < 0.001$) while those with practice of maintaining clean environment also increased from 40.4% to 54.5% ($P < 0.001$) (Amoran, 2013). Other significant improvements were practice of indoor spraying, which increased from 4.7% to 48.2% and it was a significant result ($P < 0.001$); use of window and door nets, which increased by almost two folds ($P < 0.001$) and use of drugs which changed from 32.0% to 10.0% ($P < 0.001$). The use of traditional herbs decreased from 17.3% to 7.0% ($P < 0.001$). There was no significant improvements for use of mosquito coil ($P < 0.01$) while in the control group there were no significant changes in the practice of malaria prevention methods (Ayodeji and Akinyemi2, 2015).

2.3.3 Intermittent preventives treatment (IPT)

The studies further reveal that most of the women studied had heard about intermittent preventive treatment of malaria during pregnancy, however many of them did not have a practical experience with it. Despite low levels of knowledge and use of IPT, most of the pregnant women perceived IPT to be useful in preventing malaria and recommended that IPT distribution should go hand in hand with provision of LLINS to pregnant women (Mangeni, 2003).

A qualitative study conducted (Mbonye and Bygbjerg, 2016) it was reported that most respondents knew about the existence of SP, however, they did not know its dosage schedules. Health workers (midwives) knew the signs and symptoms of malaria, its transmission process, the drugs used and its importance among other illnesses, but they did not appreciate the danger signs and symptoms for severe and complicated malaria. In the same study health workers reported that SP was too strong for pregnant women and should be reserved for severe cases.

Many health workers and caretakers were unaware of Intermittent Presumptive Treatment (IPT), and some did not know the generic name of (SP) Fansidar (DISH II 2002).

In the same study, 77.5% of the health units had SP- the recommended drug for IPT, 47.5% of health units reported frequent stock outs in most units, available stock was not even enough to cover IPT and case management for the projected numbers in the remaining procurement periods. Only 42.2% of health units had malaria in pregnancy control guidelines. Lack of such guidelines could affect the provision of high quality and prompt IPT and malaria in pregnancy case management.

A health facility tracking survey reported that about 50% of clients attending ANC clinics received all the recommended preventive treatment including malaria prophylaxis. However, clients were more likely to receive preventive treatment including malaria prophylaxis at 28-36 weeks gestation than at the 17-24 weeks pregnancy. The same survey (DISH II, 2002B) indicates that 64.0% of the clients seen by trained providers received SP during the correct time according to the FMOH guidelines as compared to only 42.0% of the clients seen by providers who had not received in-service training.

Baseline survey about malaria in pregnancy carried out in Mubende district has shown that 45.3% of pregnant women or mothers interviewed had taken preventive treatment against malaria during the present or completed pregnancy. Of the women who had completed their pregnancies, 52% reported to have taken IPT at least once during their recent pregnancy, 26.9% twice and 2.6% three times. This study also shows that the majority of the women who had taken IPT took SP (99%) as IPT while, only 1% took CQ as IPT (Mufubenga, *et al,* 2004). This survey further reveals that of women who reported to have taken SP as IPT during pregnancy, the majority (98.6%) took 3 tablets per dose, while 2.6% took 2 tablets, 1.2% took 4 tablets and 1%took 1 tablet (Mufubenga,*et al.*, 2004.

Further it was noted that, among those pregnant women who took the 1st dose of IPT, only 35.1% took it within the recommended 12-24 weeks period, while among those who took the 2nd IPT dose of IPT the majority (78.8%) took it within the recommended 25 -36 weeks period. This study further notes that IPT uptake during pregnancy, just like ANC utilization, was influenced by maternal age (Mbonye AK et al 2016). Older women and women with higher parities tend to be complacent and confident that they have enough experience with

pregnancy and are subsequently not at risk. Health education in malaria and pregnancy should seek to change these attitudes (Mbonye et al.,2016).

The studies done by (Mufubenga *et al.*, 2004) and Mangeni (2003) have also shown that most pregnant women did not take preventive measures against malaria on their own initiative. When pregnant women fell sick, most indicated they would go to the health centre for treatment, go to the traditional birth attendant, buy medication from clinic or pharmacy, take herbal mixture, and/or take pain killers. Some women in the study thought that by going for immunization it was also protection against malaria in pregnancy (Mufubenga *et al.*, 2004). Other preventive measures taken to prevent malaria in pregnancy-though to a much lesser degree-included: cutting grass around the home, draining stagnant water, smoldering herbs and limited use of mosquito repellents(Mbonye and Bygbjerg, 2016). The MoH/WHO 2001 RBM program monitoring and evaluation survey measured the utilization of IPT with either SP or weekly CQ intake for pregnant women. The survey findings indicate that only 8.6% of the pregnant women or those who had delivered within the previous six months had received CQ prophylaxis, while none had received SP as IPT (Lutaalo et al, 2001).

Futher more a study on Knowledge of malaria prevention among pregnant women and female caregivers of under-five children in rural southwest Nigeria all the PHCs in the two LGAs provide ANC and IPTp-SP services free of charge as directed by the Nigerian Federal Ministry of Health under the malaria control, however, 40% of the PHCs reported an irregular supply of the drug. Although, 80% of the PHCs provide pharmacy services, only 15% of them were staffed by pharmacy technicians. More than half of the PHCs in the two LGAs provide FANC but only about 30% of them are practicing DOT (Ayodeji and Akinyemi2, 2015). A significant gap was noted in the practice of the IPTp strategy at the PHCs due to poor understanding of the program by most of the heads of the facilities, whereby only 50% of them had a satisfactory understanding of what IPTp is all about. Although all the heads of the PHCs correctly administer 3 tablets of SP to the pregnant women, 50% of them incorrectly did so in the first trimester, due lack of proper training on the the programme. Women were also asked during the survey if they know of ways to avoid getting malaria. Those who knew ways to avoid getting malaria were further asked to name specific ways. Ninety-two percent of women described ways to avoid getting malaria. Although the percentage of women who say there are ways to avoid getting malaria does not vary much by age or residence, greater variation is observed

among zones—from 85 percent of women in South West reporting that they know ways to avoid malaria to 97 percent of women in North West. Women living in areas with LLIN malaria campaigns are somewhat more likely to report that there are ways to avoid malaria than women who live in areas without campaigns. Women with a primary education are least likely to report that there are ways to avoid malaria compared with women who have no education or else a secondary or higher education.

2.4 Factors affecting utilization of malaria prevention commodities

2.4.1 Uses of intermittent preventives treatment (IPT)

Intermittent preventive treatment during pregnancy or IPTp is defined as the percentage of pregnant women who received two or more doses of SP/Fansidar, at least one of which was during an antenatal visit. In a study aimed at factors affecting accessibility, availability and utilization of malaria prevention commodities among women of reproductive age in Kilosa district in central Tanzania, universal access to and utilization of malaria prevention measures was defined as every person at malaria risk sleeping under a quality insecticide-treated mosquito net (LLIN) and every pregnant woman at risk receiving at least two doses of sulphadoxine-pyrimethamine (SP)(Mubyazi GM and Bloch P). Mosquito nets treated with long-lasting insecticide offer highly effective personal protection against malaria transmission.

In Mozambique, nets are distributed freely in antenatal care visits since 2006 and through mass distribution campaigns since 2009, but the country has not yet been able to report a consistent decline in malaria incidence in Changara District. Tete Province, shows an increase in malaria cases among pregnant women (Quive and Candrinho, 2015), although it has a reasonable theoretical coverage of nets distribution. In a study that evaluated household availability of nets and its determinants in Changara district, of 450 households, 62.5% had at least one long-lasting insecticide-treated net, availability of nets showed a positive association with socioeconomic status and the existence of at least one pregnant woman or child under 5 years in the household, but a negative association with distance between health facility and residence. Most of the observed nets were not in good condition, only 19.2% (95% CI 15.7-23.2) of households had at least one net in good condition. (Rupashree, Jamila and Singh, 2014).

In a study on barriers to and determinants of the use of intermittent Preventives Treatment of malaria in Pregnancy in cross rivers state Nigeria it was found that use of SP-IPTp was self-reported by 41.0 % of the total respondents. Lack of autonomy in the households to receive sulphadoxine-pyrimethamine (SP) during ANC was the main barrier to use of IPTp (83 %). Other barriers were stock-outs of free SP (33 %) and poor supervision of SP ingestion by directly observed treatment among those who obtained SP from ANC clinics (36/110 = 33 %). In the multivariate logistic regression, the odds of using SP-IPTp was increased by the knowledge of the use of insecticide treated nets (LLINS) (OR = 2.13, 95 % CI: 1.70-3.73) and SP (OR = 22.13, 95 % CI: 8.10-43.20) for the prevention of malaria in pregnancy. Use of LLINS also increased the odds of using SP-IPTp (OR = 2.38, 95 % CI: 1.24-12(Ameh et al., 2016).

In a study on Knowledge and utilization of malaria preventive measures among pregnant women at a tertiary hospital in Nigeria federal capital territory, Uses of SP-IPTp was low and was associated with knowledge of the use of LLINs and SP as well as the use of LLINS for the prevention of malaria in pregnancy (Akaba et al., 2013). There is a need to strengthen PHC systems and address barriers to the usage of SP-IPTp in order to reduce the burden of malaria in pregnancy.

A study on utilization of Intermintent Preventives Treatment in Africa, majority 58.0% of households reported owning at least 1 LLIN. On average, across all 10 countries, 35% of pregnant women in households with at least 1 LLIN used a net. Households with universal coverage (at least 1 LLIN per 2 people) had higher levels of net use among all family members. In all countries sampled, the predicted probability of LLIN use by pregnant women was significantly higher than the probability of not use by most other household members except non-pregnant women of reproductive age.

Study by (Esu E et al 2013) on utilization of Intermintent Preventives Treatment 322 pregnant women were assessed across 36 health care facilities. Two hundred and forty-six (76%) of them attended the ANC in public health facilities. Age, parity, and gestational age at booking were recorded in more than 95% of the cases evaluated. The study showed that 13.7% of the women did not utilize IPTp, 53.1% had one dose of IPTp (IPTp1), and 24.2% had two doses of IPTp (IPTp2), while 3.1% had three doses of IPTp (IPTp3) (Esu E et al 2013). The overall

utilization of two doses or more of IPTp (IPTp2+) was 30.7%. There was good documentation of the basic obstetric information of pregnant women in the health care facilities examined in this study, but the overall utilization of IPTp was very low(Esu E et al 2013). Efforts at ensuring early ANC booking and regular visits may be a potential means of increasing IPTp utilization in health care facilities in the state(Esu et al., 2013).

In another study on utilization of preventive measures by pregnant women, 61.29% reported that malaria is a preventable disease using bed nets. Further inquiries revealed that of the total 864 study participants, 770 (89.1%) of them claimed that they are currently owned bed net (any kind) in the households. Of these, 652 (84.67%) of the households possessed functional bed nets. About twenty six percent of the general population uses LLIN in the previous date. Moreover, of the total 95 pregnant women, 56 (56.95%) of them were reported to have been slept under bed net a day before data collection. The study also revealed that traditional methods which are not yet proven scientifically were applied to prevent malaria in the community. Nearly 40% of study participants admitted that they use traditional healers to prevent malaria (Rupashree, Jamila and Singh2, 2014). These include: eating garlic with green paper (22%), drink juices of haregerasa (8%), polishing the floor with ten jut (5%), drinking endode juice (3%), never eat vegetables (2%) (Enato et 2007).

In a study that assessed the level of malarial infection in relation to some epidemiological factors, gravidity and pregnancy period of antenatal clinic attendees at the Federal Medical Centre, Makurdi, Benue State, Nigeria. Malarial infection in placental blood in relation to gravidity of pregnant women at delivery in the maternity clinic of the same hospital was assessed, of the 163 pregnant women examined at the antenatal clinic, 68.3% (111/163) were infected with malaria. Pregnant women that are illiterates ($\chi(2) = 15.44$, $P=0.100$) and those that are farmers ($\chi(2) = 9.20$, $P=0.270$) had the highest infection rate with no significant difference respectively. Malarial infection was significantly higher in the multigravida, 57.6% (34/59) ($\chi(2) = 5.16$, $P=0.007$) and non-significant in the pregnant women at their third trimester of pregnancy, 60.9% (53/89) ($\chi(2) = 4.45$, $P=0.108$). Placental malaria was significantly higher in the primigravidae among pregnant women at delivery ($\chi(2) = 9.33$, $P=0.000$). A significant difference ($\chi(2) = 33.52$, $P=0.000$) was observed between pregnant women that did not use any malaria preventive methods, 91.2% (31/34) and those that used single, 64.3% (65/101) and combined, 46.4% (13/28) methods of prevention. Malaria remains highly prevalent among

antenatal clinics attendees in Makurdi, Nigeria. Combined method of prevention (insecticides treated nets and insecticide spray) yielded good results and its use is advocated in preventing malaria among the pregnant women (Amuta, Houmsou and Wama 2014). Nearly one fifth (20.7%) of the pregnant women were using mosquito net.

In the 2010 National malaria index survey (NMIS), IPTp uses were estimated at 13 percent, an increase from 8 percent in 2008. Three in ten women 30% with a live birth in the two years preceding the survey report taking some type of antimalarial medicine to prevent getting malaria during the last pregnancy, higher than the percentage reported in the 2008 NDHS 18%. One in five women 20% says they took SP/Fansidar at least once during the pregnancy, compared with 11 percent in 2008. Overall, 15 percent of women say they took SP/Fansidar during an ANC visit.

Women in urban areas 46% are more likely to take any antimalarial drugs during pregnancy compared with their rural counterparts 25%. The percentage of women who reported taking antimalarial medicines to prevent malaria during pregnancy ranges from 20% in the North East zone and 44 percent in South-South zone. Use of any antimalarial during pregnancy increases dramatically with women's education, from 16 percent of uneducated women to 65 percent of those with more than secondary education. It also increases with wealth, from 9 percent of the poorest women to 54 percent of the richest women.

2.4.2 Ownership of Mosquito Nets

The 2010 NMIS included questions on bed net ownership and use, type of net and source, and reasons for not using a net. In addition, questions were asked to determine who had slept under each net the previous night and, if no one had, the reasons why the net was not used. Presents information on the percentage of households that have any type of mosquito nets, an insecticide-treated net (ITN), and a long-lasting insecticidal net (LLIN), by residence, zone, area for LLIN malaria campaigns, and wealth quintile.

Overall, 44 percent of houscholds have at least one mosquito net, 42 percent have at least one ITN, and 41 percent have at least one LLIN. This implies that almost all ITNs owned by households in Nigeria are LLINs. Compared 2003 with 2008 NDHS surveys, when only 2

and 8 percent, respectively, owned at least one ITN, ownership of mosquito nets has increased quite substantially to the current level of 42 percent (NPC and ICF Macro, 2009).

This sharp increase in net ownership by households can be attributed to the LLIN mass distribution campaign supported by the Global Fund, the World Bank, DFID, Support for the National Malaria Control Programme (SuNMaP), and the MDG funds through the government of Nigeria. Ownership of at least one ITN varies widely by background characteristics; it is notably higher among rural households (45 percent) than among urban households (33 percent). Among zones, it ranges from 20 percent of households in South West to 63 percent of households in North East. Households in LLIN World Bank Booster areas (72 percent) and in other LLIN campaigns (75 percent) are much more likely to own at least one ITN than households in areas where there are no LLIN campaigns (22 percent). Half of the households in the lowest wealth quintile (49 percent) own at least one ITN compared with only one-third of the households in the highest wealth quintile (34 percent).

There are several ways to procure or obtain a mosquito net in Nigeria. A pregnant woman may

Receive a mosquito net during a routine antenatal care visit. Parents of children under age 5 years may receive a net during a routine immunization visit to a health facility. Mosquito nets can also be obtained during mass distribution campaigns, and they can be purchased directly through various avenues. Mass net distribution campaigns are the main distribution channel for mosquito nets (56 percent).

Other major sources of nets in Nigeria are open markets (19 percent) and primary health centers or health posts (17 percent). At the zonal level, considerable variation exists in source of nets. Only one-quarter of nets in South-South are obtained through a net distribution campaign compared with more than seven in ten (71 percent) nets in North West. A primary health centre or health post is the primary source of nets for households in South-south (64 percent) – but a source for only 7 percent of nets in North East. The open market is a more significant source of nets in North East (42 percent) than in any other zone. Nets in the World Bank Booster areas (67 percent) and in the areas with other LLIN campaigns (80 percent) are substantially more likely than those in areas with no LLIN campaigns (15 percent) to be obtained from net distribution campaigns. The main sources for nets in areas with no LLIN

campaigns are the open market (46 percent) followed by primary health centres or health posts (22 percent).

In a study by (Fuge and Ayanto, 2015) only 15.8 % of 398 mothers owned at least one LLIN. This was due to its unavailability in markets and unsustainable distribution. More than half of the mothers who owned the LLINS did not have a number proportional to their family size.

2.4.3 Use of Mosquito Nets by Women

From NDHS carried out in 2010 about three in ten 29% of all women in all households reported that they slept under any net the night before the survey, an increase from about one in ten 9% in the 2008 NDHS. A similar percentage 28% reported that they slept under an ITN the night before the survey, an increase from 4 percent in 2008. The data further show that 28% slept under an LLIN the night before the survey, indicating that almost all ITNs are LLINs. Overall, 29% of all women slept under an ITN or in a dwelling sprayed with IRS. Regardless of the type of net (any net, ITN, or LLIN), net usage is higher among rural women (32 to 34%) than among urban women (18 to 19%). Women in North East (51 to 55%) are the most likely to have slept under any of the specified nets the previous night, and women in South West are the least likely (10 to 11%). About half of women in the LLIN World Bank Booster areas and in areas with other LLIN campaigns reported that they slept under any net, an ITN, or an LLIN the previous night compared with about one in eight women in areas where there are no LLIN campaigns. Wealth and education show an inverse relationship for net usage among women, 17% of women with more than secondary education slept under a net, an ITN, or an LLIN the previous night compared with 42 to 44% of women with no education.

Women in households with at least one ITN, six in ten women slept under an ITN the previous night, an increase from four in ten in 2008. This proportion is highest among rural women 63%, women in North East 76%, those living in LLIN World Bank Booster areas (68 percent) and in areas with other LLIN campaigns 61%, and among uneducated women 72% and poorest women 74%. More than one-third 34 to 35 % of pregnant women age 15-49 reported sleeping under any of the specified nets (ITN, or LLIN) the night before the interview, this shows an increase from 12%(any net) and 5% (an ITN) reported in the 2008 NDHS. Net usage varies by residence, zone, educational attainment, and wealth quintile

Among pregnant women in all households, those in rural areas are more than twice as likely to use any type of the specified nets as their urban counterparts. 39 percent of pregnant women in rural areas slept under an ITN compared with 16 percent in urban areas. Among zones, usage of any net (any net, ITN, or LLIN) is the lowest in the South East (12 percent) and the highest in the North East (47 to 56 percent). About half of pregnant women with no education slept under any of the specified nets the previous night, compared with about one-fifth of pregnant women with any level of education. Looking at wealth, the women in the highest wealth quintile are the least likely to have slept under any of the nets on the previous night (17 to18%). Among pregnant women living in households with at least one ITN, 65 percent slept under an ITN the previous night, an increase from 44 percent in 2008. The variation by background characteristics in ITN use by pregnant women in households with at least one ITN follows patterns similar to those observed for pregnant women in all households.

In another study 52 % of the mothers had not slept under bed net the previous night. This was due to its being dirty, old, had holes and in some cases lack of awareness on how to install it and its importance to prevent malaria. Higher education was identified as the determining factor for LLINS utilization ($P<0.05$) (Fuge and Ayanto, 2015). There are differences between urban and rural community on usage and access to LLIN in a study carried out in Enugu. For the urban community, 106 (71.6%) respondents used LLINs as against 99 (66.9%) in the rural community, LLIN was always accessible to 112 (75.7%) and 54 (36.5%) respondents in the urban and rural communities respectively. Findings from the national malaria demographic health survey relating to the preventive health behaviour in malaria includes bed-net usage among mothers of under-fives was generally low across the six geo-political zones as only 10% of the respondents claimed to use bed nets. The survey revealed that the preventive measures reportedly adopted included the use of the following: Window/door nets (32.6%), insecticide aerosol (33.8%), repellents (22.7%) and herbs (23.0%) (World Health Organization, 2007).

2.4.4 Reasons for Not Using a Mosquito Net

Net ownership does not guarantee usage; non-usage of net is the percent distribution of the households that own a net that no one slept under during the night preceding the survey. Overall, 18% of households had at least one net that was not slept under the previous night, a decrease from 28% of households in the 2008 NDHS. The most common reason why no one slept under the household net the previous night is that it was too hot to sleep under the net (18% of households), with the percentages being higher among Household in North West (31%). Sixteen percent of households reported that the net was too difficult to hang, with the percentage being higher in urban households (23%), households in South East (36%), and households in the fourth highest wealth quintile (23%). Finally, 14% of households reported that the net was not needed last night, and 13% reported that there were no mosquitoes.

2.5 Summary of Key findings

About 84.7% of the world population had fair knowledge about malaria disease and 8.6% were aware of the causative agent. Some of the pregnant women had misconception regarding the mode of transmission of malaria. Half (51.1%) of the pregnant women had knowledge of symptoms of malaria as fever. Some pregnant women knew that long lasting insecticide-treated bed nets (LLINS) prevent malaria in pregnancy and majority of pregnant women were aware of the IPTp-SP strategy's and the recommended three tablets after quicken and one month spacing of administration of SP. In the previous study on indoor residual spray (IRS) among pregnant women, only 5.37% believed that malaria can be prevented using IRS.

Net ownership does not guarantee usage and non-usage of net is the percent distribution of the households that own a net that no one slept under during the night preceding the survey. In Nigeria about three in ten 29% of all women in all houscholds slept under any net the night before the survey. Pregnant women in rural areas are more than twice as likely to use any type of the specified nets as their urban counterparts. Those with higher education and with high income are less likely to use any form of bed nets compare with those with less education and low income. . Pregnant women with low level of education, those that live in rural areas and those with low income sleep under mosquitoes net.

Reasons given by those that did not sleep under bed nets were: being dirty, too old, had holes, causes discomfort, heat and in some cases lack of awareness on how to install it and its importance to prevent malaria

About half of pregnant women with no education slept under any of the specified nets the previous night, compared with about one-fifth of pregnant women with any level of education. Looking at wealth, the women in the highest wealth quintile are the least likely to have slept under any of the nets on the previous night (17 to18%). Among pregnant women living in households with at least one ITN, 65 percent slept under an ITN the previous night, an increase from 44 percent in 2008. The variation by background characteristics in ITN use by pregnant women in households with at least one ITN follows patterns similar to those observed for pregnant women in all houscholds.

2.6 Summary of research gaps

There are gaps in Knowledge of malaria preventives commodities among women attending ANC most especially in the rural areas also level of awareness was equally low. Attitudes of women attending ANC were not well researched.

CHAPTER THREE

METHODOLOGY

3.1 Study area

Kwara state is one of the thirty six states in Nigeria with Ilorin as its state capital. The state has a land area of about 32,500km and share boundaries with Ekiti, Oyo, Kogi and Niger state. The state is located north of the equator and thus has a tropical climate with high temperatures, diurnals variations which are more pronounced than seasonal ones. The state has a projected population of 2,185,442 based on the 2006 population census with annual growth rate of 3.2%. The state has 16 LGA of which the study was carried out in Asa LGA.

Asa LGA has an estimated population of 124,668 with 62,751 and 61,917 male and females respectively and represents about 5.3% of the total population estimated for Kwara state. The LGA comprises of 3 districts, namely Afon, Onire and Owode which are further divided into seventeen political wards for ease of administration and to bring government closer to the people.

Asa local government area was created in 1976 and has it administrative headquarter in Afon and is one of the rural LGA in Kwara state. It is located in north-central geopolitical zone and is one of the LGA in Kwara state that forms Ilorin emirate. It shares boundaries with Ilorin west and Oyun LGA, and Oyo state. It has one secondary, 55 primary and 12 private health institutions; there are 50 primary h000-*and 13 secondary schools in the local Government. Major occupation of the inhabitants of the Local Governments is farming others are petty trading, teaching and artisans.

3.2 Study design

A descriptive cross sectional study was employed to achieve research objectives.

3.3 Study population

The study was carried out among the women who were attending antenatal care in Asa LGA

3.3.1 Inclusion criteria

All pregnant women who were attending ANC and permanent residents in Asa LGA

3.3.2 Exclusion criteria

Pregnant women who present in the antenatal clinics with complications and obstetrics emergency were exernpted from this study.

3.4 Sample size determination

$$n = z_{\alpha}^{2} \frac{pq}{d^2}$$

Where:

n = sample size

Z_{α}= the standard normal deviate

p-=46.4%(O.464) i.e Proportion of pregnant women who used combined methods of malaria prevention commodities (Amuta E.Houmsou R. Wama E. Ameh M) pg 50

q=1-p

q=1-0.464

q=0.536

d=Degree of accuracy desired

$$n=\frac{(1.96)^2 \times 0.464 \times 0.536}{(0.05)^2}$$

n=382

Since the study population (6,798) was less than 10,000, the required sample size was determined using the following formula

$$nf = 1 + \frac{n}{\frac{n}{N}}$$

3.3.2 Exclusion criteria

Pregnant women who present in the antenatal clinics with complications and obstetrics emergency were exempted from this study.

3.4 Sample size determination

$$n = z_{\alpha}^{2} \frac{pq}{d^2}$$

Where:

n = sample size

Z_{α}= the standard normal deviate

p-=46.4%(O.464) i.e Proportion of pregnant women who used combined methods of malaria prevention commodities (Amuta E,Houmsou R, Wama E, Amch M) pg 50

q=l -p

q=1-0.464

q=0.536

d=Degrec of accuracy desired

$$n=\frac{(1.96)^{2} \times 0.464 \times 0.536}{(0.05)^{2}}$$

n=382

Since the study population (6,798) was less than 10,000, the required sample size was determined using the following formula

$$nf = 1 + \frac{n}{\frac{n}{N}}$$

Where;

nf = Desired sample size when population is less than 10,000

n= Desired sample size when population is more than 10,000

N= Estimated study population

$$nf = \frac{382}{1 + \frac{382}{6,798}}$$

nf =362

To correct for 10% non-response rate

$$n = \frac{nf}{1-n_R}$$

$$n = \frac{362}{1-10\%}$$

$$n = \frac{362}{0.9}$$

n= 402

3.5 Sampling techniques

Multi stage sampling technique was used for samples selection.

Stage 1; Three wards were selected from each of the 3 districts in the LGA using simple random sampling by balloting making a total of nine wards.

Proportional allocation of samples to each wards selected was done

Stage 2; two health facilities were selected from the list of each ward selected in stage one above using simple random sampling by balloting.

Stage 3; Eligible respondents were selected from each of the health facilities selected in stage 2 above using systematic random sampling till desire sample size was achieved.

3.6 Data collection methods

3.6.1 Description and design of the study instruments

Semi-structured Interviewer administer questionnaire was design, adapted and used for data collection. It had the following sections: socio-demographic variables, knowledge of pregnant women on malaria preventives commodities, attitudes of pregnant women towards malaria preventives commodities, measures taken by pregnant women to prevent malaria and factors affecting utilization of malaria preventives commodities.

3.6.2 Training of Research assistance

Research assistances were requited among the residents Doctors from Department of Community Medicine, Ladoke Akintola University Teaching Hospital, Osogbo.

Training was organized by the researcher with the study instruments and research assistance helped in area of data collection and collation. Each filled questionnaire was check for completeness and incomplete one was re-administer

3.6.3 Pre-test of the study instruments

The study instrument was pre-tested in Moro LGA of kwara state because the inhabitants have similar culture and is about 15kilometers away from Asa LGA. This was to ensure validity and reliability of the instruments. Pre-test also gave an idea of the level of difficulty and complexity which affect the administration of the instrument. The pre-tested instrument was analyzed and necessary corrections were made.

3.6.4 Field work

The field work carried out were the pre-test carried out in Moro LGA and the administration of questionnaire to the women attending ante natal care in health facilities at Asa Local Government Area of Kwara state.

3.7 Data Analysis Methods

3.7.1 Dependent variable

Long lasting insecticides treated net (LLINS), intermittent preventives treatments (IPT), Indoor residual spray (IRS)

3.7.2 Independent variables

Independents variables were the socio-demographic variables like age, sex, occupation, and marital status, levels of education, ethnicity, and religion. They were on Y-axis and not affected and not depending on variables on X-axis.

3.7.3 Data entry and analyze

Data obtained was manually sorted out, edited and coded before they were fed into the computer for statistical analysis using epi info version 7.1.4. Data analysis was done using both descriptive and inferential statistics. Data analysis (Univariate and bivariate) was done to produce frequency distribution tables and cross tabulations. Univariate analysis was carried out- frequency of age, marital status, religion, usage of LLINs. Bivariate analysis was carried out to measure association between knowledge and utilization of malaria prevention commodities, attitude and utilization of malaria prevention commodities, knowledge and attitude of malaria prevention commodities and socio-demographic variables and utilization of malaria prevention commodities

Knowledge Score

Ten questions were asked on malaria preventives commodities, those who were able to answer 8 questions and above correctly were said to have good knowledge, those that answer between 5 and 7 questions correctly were said to have average knowledge and those that answered less than 5 questions correctly were categorized to have poor knowledge.

Attitudinal rating

A Lickets method of attitudinal Scoring and grading was used to grade attitude of pregnant women in Asa LGA towards malaria preventives commodities. Six questions were asked and none of the questions were in reverse orders, the scores ranges from 6 points to 30 points. Those who scored more than 15 points were said to have positive attitude and those who scored less than 15 points were said to have negatives attitude

3.8 Ethical approval

A research ethical approval was obtained from Kwara Ministry of Health Ethical review board, Ilorin and permission to go into the field was given by Chairman of Asa LGA, Afon. Singed consent was obtained from participants and confidentiality was maintained by coding of

questionnaire. Purpose of the study were explained to the participants in the language the understand best and they have the right to withdraw from the study anytime.

3.9 Limitation of Study

1. Since questionnaires were not administered the same day and movement of participants cannot be restricted it is possible some participants have an ideal of the questionnaires before it is administered on them.

CHAPTER FOUR

RESULTS

4.1 Socio-demographic and job related characteristics

The mean age of respondents was 29.64 years with a standard deviation of 6.45. One hundred and forty eight (36.8%) respondents were with in age 25-32 years. Majority 306 (76.1%) were married, 283 (70.4%) are Muslim and 243 (60.4%) are Yoruba's. One hundred and sixty six (41.3%) had secondary education, one hundred and fifty three (38.1%) were traders and majority of respondents 185 (61.3%) were from extended family.

Table 4.1: Frequency distribution of socio-demographic variables of respondents

Sociodemographic Status	Frequency	(%)
Age(years)		
15-24	96	(23.9)
25-34	148	(36.8)
35-44	107	(26.6)
≥ 45	51	(12.7)
Marital Status		
Single	56	(13.9)
Married	306	(76.1)
Divorced	11	(2.7)
Widow	22	(5.5)
Separated	7	(1.7)
Religion		
Islamic	283	(70.4)
Christianity	119	(29.6)
Ethnic Group		
Yoruba	243	(60.4)
Hausa	41	(10.2)
Fulani	58	(14.4)
Nupe	34	(8.5)
Others	26	(6.5)
Level of Education		
No formal	37	(9.2)
Quranic	54	(13.4)
Primary	93	(23.1)
Secondary	166	(41.3)
Tertiary	52	(12.9)
Occupational Level		
Full house wife	39	(9.7)
Trading	153	(38.1)
Farming	42	(10.4)
Artisan	73	(18.2)
Apprenticeship	64	(15.9)
Unemployed	31	(7.7)
Type of family		
Nuclear	117	(38.7)
Extended	185	(61.3)
Total	**302**	**(100.0)**

4.2 Distribution of respondents knowledge on malaria prevention

Most of the respondents 253 (62.7%) believed that malaria is transmitted by mosquitoes bite, other mode of transmission known to respondents were house fly 19 (4.7%), Cockroach 47(11.7%), bed bud 62 (15.4%), and germs 21(5.2%). Three hundred and eighty three (87.8%) knew that malaria can be prevented, 296 (73.6%) believed malaria can cause abortion, 204 (50.7%) knew that malaria can cause IUFD, 268 (66.7%)

Table 4.2; Distribution of Respondents knowledge on malaria prevention

Responses	Frequency	(%)
Mode of transmission		
Mosquito bite	253	(62.7)
house fly	19	(4.7)
Cockroach	47	(11.7)
Bedbug	62	(15.4)
Germs	21	(5.2)
Total	402	(100.0)
Malaria Prevention		
Yes	353	(87.8)
No	49	(12.2)
Total	402	(100.0)
Effects on fetus (abortion)		
Yes	296	(73.6)
No	106	(26.4)
Total	402	(100.0)
Effects on Pregnancy (IUGR)		
Yes	204	(50.7)
No	199	(49.5)
Total	402	(100.0)
Treatment in pregnancy		
Yes	361	(89.8)
No	41	(10.2)
Total	402	(100.0)
Effects on fetus(IUFD)		
Yes	226	(56.2)
No	176	(43.8)
Total	402	(100.0)
Effects on family saving		
Yes	303	(75.4)
No	99	(24.6)
Total	402	(100.0)
Knowledge on if malaria can cause fever		
Yes	359	(89.3)
No	43	(10.7)
Total	402	(100.0)
Affectation of unborn child		
Yes	268	(66.7)
No	134	(33.3)
Total	402	(100.0)

4.3 Proportion of participants with correct response to the knowledge variables on malaria

Ten questions were asked on knowledge of malaria preventives commodities, respondent with poor knowledge (27.9%) were able to answered less than 5 questions correctly, Average knowledge (428.2%) were able to answered between 5 and 7 questions correctly and good knowledge(23.9) were able to answered 8-10 questions correctly.

Table 4.3 Proportion of participants with correct response to the knowledge variables on malaria

Knowledge	Points scored	Frequency	(%)
Good Knowledge	8-10	96	(23.9)
Average Knowledge	5-7	194	(48.2)
Poor Knowledge	1-4	112	(27.9)
Total		402	(100.0)

4.4 Participants response to Knowledge on effect of malaria in pregnancy

Three hundred and forty four (85.6%) respondents' believed that malaria can lead to maternal death, while respondents also believed that still birth 332(82.6%), blood loss 306 (76.1%), pregnancy loss 291 (72.4%), premature labour 207 (51.5%), loss of appetite 198 (49.3) and pre-mature rupture of membrane 105(26.1%) can also result from malaria complication during pregnancy.

4.4 Participants response to Knowledge on effect of malaria in pregnancy

Three hundred and forty four (85.6%) respondents' believed that malaria can lead to maternal death, while respondents also believed that still birth 332(82.6%), blood loss 306 (76.1%), pregnancy loss 291 (72.4%), premature labour 207 (51.5%), loss of appetite 198 (49.3) and pre-mature rupture of membrane 105(26.1%) can also result from malaria complication during pregnancy.

Table 4.4 Participants response to Knowledge on effect of malaria in pregnancy

Responses	Yes (%)	No (%)	Total
Maternal death	344(85.6)	58(14.4)	402(100.0)
Still birth	332(82.6)	70(17.4)	402(100.0)
Blood loss (anemia)	306(76.1)	96(23.9)	402(100.0)
Pregnancy loss(abortion)	291(72.4)	111(27.6)	402(100.0)
Premature labour	207(51.5)	195(48.5)	402(100.0)
Loss of appetite	198(49.3)	204(50.7)	402(100.0)
Pre-mature rupture of Membrane (PROM)	105(26.1)	297(73.9)	402(100.0)

4.5 Distribution of participants thoughts on malaria preventives commodities and malaria prevention in pregnancy

One hundred and sixty eight (41.8%) respondents strongly agreed that Sulphadoxine-pyrimethamine prevent malaria in pregnancy, respondents also strongly agreed that malaria can be prevented by the following LLIN 135(33.6%), Clean environment 118(29.4%), insecticidal residual spray 182 (45.3%) and insect repellant 209(52.0%).

Table 4.5 Distribution of participants' thoughts on malaria preventives commodities and malaria prevention in pregnancy

Responses	Strongly Agreed	Agreed	Undecided	Disagreed	Strongly disagreed
Clean environment	118(29.4)	187(46.5)	32(8.0)	48(11.9)	17(4.2)
LLIN	135(33.6)	204(50.7)	18(4.5)	32(8.0)	13(3.2)
Sulphadoxine-Pyrimethamine (SP)	168(41.8)	125(31.1)	52(12.9)	36(9.0)	21(5.2)
Long dresses	99(24.6)	111(27.6)	64(15.9)	76(18.9)	52(12.9)
Insecticides residual spray	182(45.3)	153(38.1)	19(4.7)	31(7.7)	17(4.2)
Insect repellants	209(52.0)	147(36.6)	8(2.0)	24(6.0)	14(3.5)

4.6 Participants response to different methods of preventing malaria in pregnancy

Two hundred and fifty one (53.3%) of respondents believed that malaria can be prevented by LLIN, while 349(86.1%) believed clearing of bush, 349(86.1%) clearing of drainage, 286(71.1%) indoor residual spray, 215(53.5%) sulphadoxine-pyrimethamine.

Table 4.6 Participants response to different methods of malaria prevention

Methods of malaria prevention	Yes (%)	No (%)	Total
Clearing of the bush	363(90.3)	39(9.7)	402(100.0)
Clearing of the drainages	349(86.1)	56(13.9)	402(100.0)
Mosquito repellant	319(79.4)	83(20.6)	402(100.0)
Indoor residual spray (Insecticide)	286(71.1)	116(28.9)	402(100.0)
Sulphadoxine-pyrimethamine	215(53.5)	187(46.5)	402(100.0)
LLIN	215(53.5)	187(46.5)	402(100.0)

4.7 Proportion of the respondents currently owning LLIN

One hundred and sixty-five (41.0%) respondents owns LLIN while 237 (59.0%) do no own LLIN and Sixty three 38.0% of respondents of those owning LLIN are currently using LLIN while 102(62.0%) of those owning LLIN are not using it

Table 4.7 participant responses to ownership and current usage of LLIN

Variables	Frequency (%)
Ownership of LLIN	
Owning LLIN	165(41.0%)
Not owning LLIN	237(59.0%)
Those currently using LLIN	
Presently using LLIN	63(38.0%)
Not using LLIN presently	102(62.0%)

4.8 Reasons why respondents do not use LLIN

Sixty-nine (67.6%) of respondents using LLIN out of 102 complain of heat, 16 (15.7%) complain of it smell and 7(6.9%) said it was causing discomfort

Table 4.8 Reasons why respondents do not use LLIN

Reasons for not using LLIN	Frequency	(%)
Heat	69	(67.6)
Smell	16	(15.7)
Colour	10	(9.8)
Discomfort	7	(6.9)
Total	102	(100.0)

4.9 Duration of LLIN among those using LLIN

Most respondents 74 (44.8%) have being using LLIN for between 1-3 months, 23(13.9%) have been using it for less than one month; 85 (52.1%) use it occasionally and 42 (25.5%) always.

Table 4.9 Response of respondents to duration of LLIN uses

Duration of usage of LLIN (Months)	Frequency	(%)
< 1 month	23	(13.9)
1-3 months	74	(44.8)
6-9 months	41	(24.8)
10-12 months	16	(9.7)
>12 months	11	(6.7)
Total	165	(100.0)
Period/Time when LLIN is used		
Always	42	(25.5)
Occasionally	85	(52.1)
During raining season	37	(22.4)
Total	165	(100.0)

4.10 Usage of IPT (SP) by respondents

Three hundred and nine (77.1%) of the respondents used Sulphadoxine-pyrimethamine as prophylaxis for malaria prevention in pregnancy, most respondents 174 (56.3%) used first dose of SP between 24-28weeks of gestation, 101(25.1%) used SP as second dose and 261(84.5%) of respondents attributed usage of SP to its non-availability.

Table 4.10; Usage of IPT(SP) by respondents

Variables	Frequency	(%)
Uses		
Yes	309	(77.1)
No	93	(23.1)
Total	402	(100.0)
Doses		
3 tablets at once at 24weeks of gestation	208	(51.7)
3 tablets one month after the first dose	101	(25.1)
Total	309	(100.0)
Stage of pregnancy		
Second trimester	84	(27.2)
Second trimester	174	(56.3)
Third trimester	33	(10.7)
Third trimester	18	(5.8)
Total	309	(100.0)
Determinant of SP usage		
Availability of Sulphadoxine – Pyrimethamine (SP)	261	(84.5)
Attitude of health workers	4	(1.3)
Side effects of Sulphadoxine – Pyrimethamine (SP)	16	(5.2)
Affordability	28	(9.0)
Total	309	(100.0)

4.11 Factors that affect utilization of LLIN among respondents

One hundred and twenty six (31.3%) said they were afraid of chemical poison was the reason why they are not using LLIN, religious belief 17(4.2%) and cultural belief 21(5.2%) were the socio-cultural factors that affects utilization. Only environmental factor mentioned that affect utilization of LLIN was heat182 (45.3) and 178 (44.3%) said the reason why they are not using LLIN was because of cost.

Table 4.11; Factors that affect utilization of LLIN

Factors	Yes (%)	No (%)	Total
Chemical			402(100.0)
Chemical poison	126(31.3)	276(68.7)	
Socio-cultural factors			402(100.0)
Religious belief	17(4.2)	385(95.8)	
Culture belief	21(5.2)	381(94.8)	402(100.0)
Attitude of the health workers	54(13.4)	348(86.6)	402(100.0)
Environmental factors			402(100.0)
Heat	182(45.3)	220(54.7)	
Colour and shape of LLIN	92(22.9)	310(77.1)	402(100.0)
Economic factors			402(100.0)
Cost of LLIN	178(44.3)	224(55.7)	

4.12 Association between knowledge on malaria prevention and uses of sulphadoxine-pyrimethamine

Eighty-two (26.5%) of respondents who used SP had good knowledge, 159(51.5%) who used SP had fair knowledge and 68(22.0%) of those with poor knowledge used SP. One hundred and ninety-four (48.3%) of respondents had fair knowledge on uses of sulphadoxine-pyrimethamine, while 96(23.9%) had good knowledge and 112(27.9%) have poor knowedge on SP usage. However, this was statistically significant at p-value = 0.001

Table 4.12; Association between uses of sulphadoxine-pyrimethamine and knowledge score

Knowledge on Prevention of Malaria	Sulphadoxine – Pyrimethamine (SP)		
	Used	Don't used	**Total**
Good Knowledge (%)	82(26.5)	14(15.1)	96(23.9)
Average Knowledge(%)	159(51.5)	35(37.6)	194(48.3)
Poor Knowledge (%)	68(22.0)	44(47.3)	112(27.9)
Total	309(100.0)	93(100.0)	402(100.0)

X^2=23.208, df=2, p-value= 0.001

4.13 Association between knowledge and attitudes of women attending ANC towards malaria preventive commodities.

Proportion of those with good knowledge was 96 and 53(55.2%) had positive attitude and 43 (44.8%) had negatives attitudes, 194 of respondents had fair knowledge while 103(53.1%) had positive attitudes and 91(46.9%) had negatives attitudes and 112 of respondents had poor knowledge in which 17(15.2%) had positive attitude and 95(84.8%) had negative attitude. Association between knowledge score and attitudinal rating was statistically insignificant at p-value=0.001

Table 4.13; Association between overall knowledge and over all attitudes towards prevention of malaria in pregnancy

Knowledge Score on prevention of malaria in Pregnancy	Attitude Scores towards prevention of malaria in Pregnancy		
	Positive Attitude(%)	Negative Attitude(%)	Total(%)
Good	53(55.2)	43(44.8)	96(100.0)
Average	103(53.1)	91(46.9)	194(100.0)
Poor	17(15.2)	95(84.8)	112(100.0)
Total	173(43.0)	229(57.0)	402(100.0)

X^2=95.437, df=4, p-value= <0.001

4.14 Association between socio-demographic variables and usage of LLIN

Proportion of respondents who used LLIN and had secondary education was 87(58.4%) and 7 (63.6%) of those with tertiary education used LLIN the association between level of education and utilization of LLIN was statistically significant at p value 0.003. Most civil servants 26(76.5%) used LLIN, majority of the traders 84 (56.0%) used LLIN and the association between occupation and utilization of LLIN was statistically significant at p-value 0.007. Proportion of those with nuclear family and used LLIN was 62(52.1%) and 89 (41.2%) of those with extended family used LLIN and association between type of family and utilization of LLIN was not statistically significant p value 9.055.

Table 4.14; Association between socio-demographic variables and usage of LLIN

Variables	UTILIZATION OF LLINs Net Used (%)	Not used (%)	Total (%)	X^2	Df	P-value
Education						
No formal	8 (25.8)	23 (74.2)	31(100.0)			
Primary	49 (34.0)	95 (66.0)	144(100.0)			
Secondary	87 (58.4)	62 (41.6)	149(100.0)	23.95	3	0.003
Tertiary	7 (63.6)	4 (36.4)	11(100.0)			
Total	151 (45.1)	184 (54.9)	335(100.0)			
Occupational						
Full house wife	15 (40.5)	22 (59.5)	37(100.0)			
Trading	66 (44.0)	84 (56.0)	150(100.0)			
Civil servant	26 (76.5)	8 (23.5)	34(100.0)	15.89	5	0.007
Artisan	23 (37.7)	38 (62.3)	61(100.0)			
Apprenticeship	14 (40.0)	21 (60.0)	35(100.0)			
Unemployed	7 (38.9)	11 (61.1)	18(100.0)			
Total	151 (45.1)	184 (54.9)	335(100.0)			
Family						
Nuclear	62 (52.1)	57 (47.9)	119(100.0)			
Extended	89 (41.2)	127 (58.8)	216(100.0)	*2.68	1	9.055
Total	151 (45.1)	184 (54.9)	335(100.0)			

* Not statistically significant

4.15 Association between knowledge score and malaria prevention commodities

Sixty eight (35.6%) of those with good knowledge used LLIN and association between utilization of LLIN and knowledge score was statistically significant at p value 0.000. Proportion of those with average knowledge and clearing of bush was 185(51.0%) and association between clearing of bush and knowledge of malaria prevention was statistically significant p 0.000. One hundred and seventy eight (51.4%) of those who clear drainage had average knowledge. Proportion of respondents with good knowledge and wear long trouser and shirts were 72(33.5%) and 50(60.2) of those with poor knowledge do not use mosquitoes repellants. One hundred and seventy six 55.2% of respondents with average knowledge used mosquitoes repellant and 44 (47.3%) of those with poor knowledge do not use SP.

Table 4.15 Association between knowledge score and malaria prevention commodities

Malaria Preventives commodities	KNOWLEDGE SCORE ON PREVENTION OF MALARIA IN PREGNANCY Good Knowledge 96(23.9)	Average Knowledge 194(48.3%)	Poor Knowledge 112(27.9)	X^2	P-value
LLIN					
Yes	68 (31.6)	113 (52.6)	34 (15.8)	37.46	<0.0001
No	28 (15.0)	81 (43.3)	78 (41.7)		
Environmental					
Clearing of the bush					
Yes	91 (25.1)	185 (51.0)	87 (24.0)		
No	5 (12.8)	9 (23.1)	25 (64.1)	28.25	0.0000
Cleaning of the drainages					
Yes	87 (25.1)	178 (51.4)	81 (23.4)		
No	9 (16.1)	16 (28.6)	31 (55.4)	24.54	0.0004
Long trousers and shirt					
Yes	72 (33.5)	102 (47.4)	41 (19.1)	30.75	0.0002
No	24 (12.8)	92 (49.2)	71 (38.0)		
ISP					
Mosquito repellant					
Yes	81 (25.4)	176 (55.2)	62 (19.4)		
No	15 (18.1)	18 (21.7)	50 (60.2)		
Insecticide					
Yes	83 (29.0)	148 (51.7)	55 (19.2)		
No	13 (11.2)	46 (39.7)	57 (49.1)	39.96	<0.0001
Uses of SP					
Yes	82 (26.5)	159 (51.5)	68 (22.0)		
No	14 (15.1)	35 (37.6)	44 (47.3)		
Determinant of SP usage					
Availability	71 (27.2)	134 (51.3)	56 (21.5)		
Affordability	7 (25.0)	13 (46.4)	8 (28.6)		
Total	82 (26.5)	159 (51.5)	68 (22.0)		

Table 4.16 Association between Attitude score and malaria prevention commodities

Malaria preventive commodities	Attitude score towards prevention of malaria in pregnancy							
	Positive 173(43.0)		Negative 229(57.0)		X^2	p-value	Odd Ratio	95% Confidence limit
LLIN								
Yes	132	(61.4)	83	(38.6)	63.56	<0.00001	5.663	364,8.811
No	41	(21.9)	146	(78.1)				
Environmental								
Clearing of the bush								
Yes	161	(44.4)	202	(55.6)				
No	12	(30.8)	27	(69.2)	2.651	0.0517*	1.793	0.881,365
Cleaning of the drainages								
Yes	156	(45.1)	190	(54.9)				
No	17	(30.4)	39	(69.6)	4.266	0.0194	1.884	1.026,3459
Long trousers and shit								
Yes	112	(52.1)	103	(47.9)	15.47	0.0004	2.246	1.496.3.372
No	61	(32.6)	126	(67.4)				
IRS								
Mosquito repellant								
Yes	148	(46.4)	171	(53.6)				
No	25	(30.1)	58	(69.9)	7.116	0.0038	2.008	1.196,3.371
Insecticide								
Yes	155	(35.9)	131	(45.8)				
No	18	(22.0)	98	(84.5)	50.36	<0.0001	6.442	3.703,11.21
Uses of SP								
Yes	147	(47.6)	162	(52.4)				
No	26	(28.0)	67	(72.0)	11.22	0.0004	2.338	1.411,3.874
Determinant of SP usage								
Availability	130	(34.6)	131	(50.2)				
Attitude of health workers	1	(0.0)	3	(75.0)				
Side effects	11	(28.6)	5	(31.3)	4.281	0.2327*		
Affordability	17	(35.0)	11	(39.3)				
Total	159	(51.5)	150	(485.)				

CHAPTER FIVE

DISCUSSIONS

5.1 Introduction

Pregnant women are vulnerable to malaria and are advised to sleep under LLIN. Nationally about half (49.0%) of pregnant women age 15-49years sleep under LLIN the night before the survey. This varies by zone from a low of 23.0% in South East zone to a high of 68.0% in North West zone and LLIN uses in Kwara state by pregnant women was 38.0%. Pregnant women should receive two or more doses of SP during antenatal care visits to prevent malaria during pregnancy, just over one-third of women age 15-49years with live birth in the two years before the survey received at least two doses. Coverage of two or more doses of IPT is lowest in Niger state 10.0% and above 70.0% in Lagos, Edo and Borno-Urban and IPT uptake in Kwara state is 20.0% . Nationally, only 19.0% of women with live birth in the two years before the survey received three or more doses of SP. Coverage of three or more doses of IPT is lowest in Delta (4.0%) and Kano (6.0%) and highest in Ekiti and Borno-Urban (45.0% each).

5.2 Knowledge of pregnant women on utilization of malaria preventives commodities

Three hundred and fifty nine respondents 89.3% had knowledge of malaria and they also know that malaria is associated with fever, in a similar study carried out by (Dambhare, Nimgade, and Dudhe, 2012) on Knowledge , Attitude and Practice of Malaria Transmission and Its Prevention among the School Going Pregnant womens in Wardha District , Central India 84.7% of respondents have knowledge of malaria. These findings were closed and it may be associated with the facts that malaria is endemic in both countries and the implication of this finding is that malaria is a major problem of both countries. Also a study by (Adcraw and Gedefaw 2013) on Knowledge , Attitude and Practice of the Community towards Malaria Prevention and Control Options in Anti-Malaria Association Intervention Zones of Amahara National Regional State , Ethiopia 87.0% of pregnant women have knowledge of malaria the similarities may be due to the location of the two countries in the tropical Africa were malaria is endemic the implication is that malaria is a major health problem in the tropics and

intervention among pregnant women will be easy because of high level of knowledge among the study group.

A study carried out on pregnant women by Ayodeji et al in Nigeria it was reported that 78.9% knows the causatives agents of malaria and 86.0% knows the breeding sites. Two hundred and fifty three 62.7% of pregnant women knows that malaria is transmitted by Mosquito; in a similar study transmission of mosquito was reported to be 69.8% by (Dambhare, Ningade, and Dudhe, 2012). Which is slightly higher this difference may be due to level of awareness, in another study by fellow et al it was reported that 32.3% of respondents knew that malaria is transmitted by mosquitoes and 48.0% said bites is more at night and 1.6% knew that malaria is caused by plasmodium species. One hundred and forty nine 37.3% of the respondents have misconception about malaria transmission, house fly, cockroach, bed bug and germs were said to be responsible for transmission in a similar studies carried out by Manual, T. et al 32.8% were said to have misconception about malaria transmission the disparity may be due to differences in the level of awareness the implication on this misconception is that it may make control and eradication of malaria difficult. 48.0% said mosquito bites is more at night and 1.6% said it is caused by plasmodium spices.

It was found that 359(89.3%) of respondents knows that malaria is associated with fever this findings was higher than 51.1% reported by manual et al this may be associated with misconception on malaria symptom and the implication is that control may be difficult and mortality from malaria may increase. Three hundred and thirty two 82.6% of respondents knew that malaria causes intra uterine fetal death as against 11.0% reported by Chinyere et al there is wide disparity in this studies and could be due to differences in study area and the implication of this findings is that knowledge on effects of malaria effects.

5.3 Attitudes of pregnant women towards utilization of malaria preventives commodities

The study reveal that one hundred and forty seven (47.6%) of respondents who have positive attitudes towards malaria prevention in pregnancy use SP, and the association between malaria preventives commodities using SP and attitudinal score was statistically significant at a p value of 0.0004. In a similar study carried out by (Aderaw and Gedefaw, 2013) in Mubende district

of Uganda it was reported that a good number of pregnant women thought that SP is a good measure to prevent malaria there is a disparity with these findings and it could due to differences in cultural and religious belief. The implication of the above findings is that malaria can easily be prevented among the pregnant women in Uganda than Nigeria.

One hundred and seventy three (43.1%) respondents have positive attitudes to malaria prevention in a similar study conducted by (Adekenye, Jegede and Nwokocha, 2014) in Nigeria it was found that 78.1%, 69.0%, and 47.1% have positive attitude to malaria prevention, treatment and prevention practices respectively the similarity in prevention practices could be due to similar environment where the studies were carried out and the implication of this finding is that the preventives practices is below average which may result in higher prevalence of malaria among pregnant women. Proportion of respondents with good knowledge and positives attitudes to malaria prevention in pregnancy was 55.2% and another study by Ayodeji et al on knowledge of malaria prevention among pregnant women in South-western Nigerian reveals that 51.1% had a positive attitude towards malaria prevention, the slight disparity in the result may due the facts that the study was not carried out at the same time and it implies that there is an improvements in attitudes towards malaria prevention and malaria preventives commodities.

5.4 Types of malaria preventives commodities

In a study carried out by Dambhare 88.7% of pregnant women used LLIN for malaria prevention while 215 (53.5%) of respondents used LLIN as a preventives measures for malaria in pregnancy the findings showed that LLIN was more acceptable as a methods of malaria prevention in the study carried out by Dambhare the implication of this findings was that a lot of effort needs to be directed to improve LLIN acceptability. It was equally reported by Dambhare in his study carried out in India that 72.4% of them used insecticides spray, however the proportion of respondents who used indoor residual spray (IRS) was 286 (71.1%) which is very closed to what was reported by Dambhare the similarity may be due to increase in level of awareness in both countries the implication of this findings was that mosquitoes may developed resistant to insecticides and different strains of mosquitoes may developed.

Assessment of the intermittent Preventive Treatment for prevention of malaria in pregnancy (IPT) strategy for malaria control using Sulphadoxine-Pyrimethamine (SP) (Index, 2014) the

following result was obtained ninety two 30% of respondents own LLIN, in a similar study 58% of household were reported to own at least one LLIN, while 35% of women own one LLIN. In another study on utilization of IPT, 53.1% had one dose of IPT and 24.2% had 2 doses of IPT while 3.1% had 3 doses of IPT as reported by (Esu et al,) overall utilization of 2 doses or more of IPT was 30.7%. In another study 770(89.1%) of participants own bed net in the household, 26% uses functional bed net Barrier to utilization of LLIN as claimed by respondents were chemical poison 126(31.3%), Religion 17(4.2%), Culture 21(5.2%) and Heat 182(45.3%). In a similar study barrier to SP usage were lacks of autonomy in the household 83.0%, stock out of free SP (33.0%), poor supervision of SP in gestation by DOT (33.0%).

5.5 Factors that affects utilization of malaria preventives commodities among pregnant women

In another experimental study by Dambhare in India it was reported that malaria prevention practices did not change among experimental (90.7%) and control (88.4%) group after intervention these findings were higher than 43.1% founds among respondents this may be due to different environments where this studies were carried out, the implication of this findings is that malaria prevalence in the later will be higher. Three hundred and thirty nine (84.3%) of respondents have positive attitudes to LLIN usage in another study carried out by Fuge TG et al, 51.1% was reported to have positive attitude to malaria prevention practices this findings is lower which may be due to difference in knowledge and environment and with high positive attitude to malaria prevention malaria control among pregnant women will not be difficulty.

Two hundred and fifteen (53.5%) of respondents uses LLIN to prevent malaria in pregnancy, this is similar to 50.8% reported by Amoran O E et al, the similarity may be due to similar nature of the environments where the study were carried out

In the same study by Amoran et al maintaining clean environment increased from 40.4% to 87.4% after intervention, 363(90.3%) of respondents believed that clearing of bush and 349 (86.1%) that clearing of drainage prevent malaria in pregnancy, there is a disparity in this findings which could be due to difference in the area of study and the implication is that malaria prevention may be difficult. Two hundred and eight six (71.1%) respondents uses insecticides to prevent malaria while in a study in India by Dambhare 72.4% used insecticides

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spray the result were similar the implication is that this mode of prevention is more acceptable. Two hundred and fifteen (53.5%) used LLIN to prevent malaria but Dambrhe reported 81,2% usage of LLIN Three hundred and nine (77.1%) of respondent used Sulphadoxine-pyrimethamine but in a similar study 41.0% was reported by Ameh et al. One hundred and sixty five (41.0%) uses malaria prevention commodities this finding is not different from what Ameh et al reported 41.0% in is study on SP-IPT usage this similarity may be due to health education and implication is that there is need for more effort for SP to be more acceptable.

CONCLUSION AND RECOMMENDATIONS

Conclusion

It can be concluded from this study that about half of respondents had an average knowledge on utilization of malaria prevention, half of respondents who used SP had a fair knowledge, more over the association between knowledge and uses of SP was statistically significant. Utilization of LLIN increased with educational status and association between education and utilization of malaria of LLIN was statistically significant. It be concluded that association between knowledge and various types of malaria preventives commodities were statistically significant.

Respondents' attitude towards utilization of LLIN was positive and association between attitudes and LLIN was statistically significant, some respondents strongly agreed that SP prevents malaria in pregnancy. Malaria preventives commodities known to respondents are LLIN, SP, IRS, mosquitoes' repellants, clearing of bush and clearing of drainage. Factors identified by respondents affecting utilization of LLIN as a malaria preventive commodities were heat, color and shape, availability the association between above factors and utilization of malaria preventives commodities was statistically significant.

Recommendations

1) To Health workers

To organize health education in Asa LGA to increase the level of pregnant women knowledge and help them to developed a positive attitude towards utilization of malaria preventives commodities.

2) To State governments

To organize mass distribution of LLIN for free

To make malaria preventives commodities available and affordable

3 Non-Governmental Organizations (NGO)

To support the state government in making malaria preventives commodities available and affordable

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APPENDIX 1

Questionnaire

SECTION A: Socio-Demographic Status

1. Age _____(Years)
2. Marital Status: Single ( ) Married ( ) Divorced ( ) Widow ( ) Separated ( )
3. Religion: Islamic ( ) Christianity ( ) Traditional ( ) others (specify) .....
4. Ethnic Group: Yoruba ( ) Hausa ( ) Fulani ( ) Nupe ( ) others (specify).....
5. Level of education: No formal ( ) Quranic ( ) Primary ( ) Secondary ( ) Tertiary ( )
6. Occupation: Full house wife ( ) Trading ( ) Farming ( ) Apprenticeship ( ) Unemployed ( ) others specify ( )
7. Average Monthly Income: _____Naira
8. Type of family: Nuclear ( ) Extended ( )

SECTION B: KNOWLEDGE ON MALARIA PREVENTION BY PREGNANT WOMEN

9. What is malaria? _____
10. How is malaria transmitted? By mosquito bite ( ) By house fly ( ) Cockroach ( ) Bedbug ( ) Others specify ( )
11. Do you know that malaria is preventable? Yes ( ) No ( )
12. Do you know malaria causes abortion? Yes ( ) No ( )
13. Do you know that malaria cause IUGR Yes ( ) No ( )
14. Do you know that malaria is treatable? Yes ( )
15. malaria can cause Intrauterine Foetal Death (IUFD) Yes ( ) No ( )
16. Do you know that malaria can affect family savings? Yes ( ) No ( )
17. Do you know that malaria causes fever? Yes ( ) No ( )
18. Do you know that malaria can affect the unborn child? Yes ( ) No ( )

SECTION C: ATTITUDE OF PREGNANT WOMEN TOWARDS MALARIA PREVENTION

	SA	A	ID	D	SD
19. Do you think that clean environment can prevent malaria?	( )	( )	( )	( )	( )
20. Do you think sleeping under mosquito net can prevent mosquito bite and malaria?	( )	( )	( )	( )	( )
21. Do you think Sulphadoxine-Pyrimethamine (SP) chemoprophylaxis can prevent malaria during pregnancy?	( )	( )	( )	( )	( )
22. Do you think wearing of long dresses can prevent mosquito bite/malaria?	( )	( )	( )	( )	( )
23. Do you think that malaria is preventable?	( )	( )	( )	( )	( )
24. Do you think malaria is curable?					

SECTION D: MEASURES TAKEN BY PREGNANT WOMEN TO PREVENT MALARIA

25 How do you prevent mosquito bite?	Yes	No
Clearing of the bush	( )	( )
Clearing of the drainages	( )	( )
Using mosquito repellant	( )	( )
Using of insecticide	( )	( )
Wearing of long trousers and shirt	( )	( )
Impregnated treated net (ITN)	( )	( )

26 How do you prevent malaria?	Yes	No
By taking chemoprophylaxis Sulphadoxine-Pyrimethamine (SP)	( )	( )
By drinking local herbs	( )	( )
By buying drugs from the hawkers	( )	( )

SECTION E: EFFECT OF MALARIA ON PREGNANT WOMEN

27 Does malaria has the following effects	Yes	No
Does malaria cause blood loss (anemia)	( )	( )
Does malaria lead to pregnancy loss	( )	( )
Does malaria lead to still birth?	( )	( )
Does malaria leads to maternal death?	( )	( )
Does malaria lead to poverty?	( )	( )
Does malaria lead to loss of appetite	( )	( )
Does malaria leads to premature labour	( )	( )
Does malaria lead to Pre mature rupture of Membrane (PROM)	( )	( )

SECTION F: UTILIZATION OF MALARIA PREVENTION COMMO DITIES

28 Do you use LLIN Yes ( ) No ( ) I have stop ( )

29 Do any of the following(s) determine your usage of ITN?

	YES	NO
A Because of chemical poison	( )	( )
B Because of religious belief	( )	( )
C Because of my Cultural belief	( )	( )
D Because of the attitude of the health workers	( )	( )
E Because it causes heat	( )	( )
F Because of colour and shape of LLIN	( )	( )
G Availability of LLIN	( )	( )

I others, specify.....

30. If ITN is available will you use it? Yes ( ) No ( )

31. If your answer to 28 above I have stop, why did you stop.....

32. For how long have you being using ITN.....Months

33. How often do you use ITN?

A. Always B. Occasionally C During rainy season D Others, Specify.....

34. Do you use Sulphadoxine-Pyrimethamine (SP) during pregnancy? Yes ( ) No ( )

35. How many doses of SP do you use when pregnant?.....

36. At what stage of pregnancy do you use SP.....Weeks

37. Do any of the following determine usage of SP?

	YES	NO
Availability of Sulphadoxine-Pyrimethamine(SP)	( )	( )
Cost of Sulphadoxine-Pyrimethamine (SP)	( )	( )
Attitude of Health Workers	( )	( )
Side effects of Sulphadoxine-Pyrimethamine(SP)	( )	( )

38 Where you treated for malaria in this pregnancy? Yes ( ) No ( )

If yes where were you treated?

Hospital treatment	( )
Buy drugs from Chemist	( )
Using local herbs	( )

39 If hospital treatment, what drugs was prescribed?.....