KNOWLEDGE, PRACTICES AND PERCEPTION OF MALARIA AND ITS HOME MANAGEMENT USING ARTEMISININ-BASED COMBINATION THERAPY (ACT) AMONG MOTHERS OF UNDERFIVE IN YEMETU COMMUNITY OF IBADAN NORTH LOCAL GOVERNMENT AREA, IBADAN

BY

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DEDICATION

This study is dedicated to almighty God for his grace upon my life. He has been my strength from the beginning of the programme. I bless his name for where he took me from, where I am and where he is taking me to.

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ABSTRACT

Malaria is a serious public health problem, yet preventable and treatable.The disease is one of the world's highest rates of all cause of mortality for children under five, and about one in six children die before their fifth birthday. Hence, mothers of under-five and caregiver have a pivotal role to play in tackling this issue by improving their knowledge and skills concerning the treatment, prevention and control using appropriate approach.This study was carried out to assess knowledge, practices and perception of malaria and its home management using Artemisinin-based Combination Therapy (ACT). inYemetu community of Ibadan North Local Government.

The study was a descriptive cross-sectional survey involving the use of Expanded Programme on Immunization to facilitate the sampling and interview of respondents. This included recruiting all the mothers of under-five in Yemetu community who gave consent for the study. Four hundred (400) mothers of under-five in Yemetu community consented to participate in the study and were selected. A validated semi-structured questionnaire and self-administered questionnaire was used for data collection and respondents were assessed on a 62-point knowledge, 5-points practice and 17-points perception scales. Knowledge score ≤21 were rated poor, scores ≥22≤42 fair and scores ≥43 were considered good. Practice score ≤3 was recorded poor practice while scores ≥3 good practice. Perception scores ≤ 9 were considered unfavorable perception and scores ≥ 9 were considered favorable. Descriptive statistics and chi square tests were used to analyze data at 95% level of significance.

Respondents' mean age was 29.9 ± 7.0 years. 91.1% of them were Yoruba. Majority (91.0%) were married and (91.1%) were Yorubas. Only 23.0% correctly identified plasmodium as a cause of malaria. The correctly mentioned signs and symptoms of simple malaria were; cold (89.3%), body ache (91.3%) and fever (88.5%). The fairly correct home management practice steps include; Exposure of baby to fresh air, administration of paracetamol, and then provision of coartem(2.6%) and bathing the baby, use of paracetamol and administration of coartem (1.3%). Negative perception shown by the respondents include: Only (15.0%) believed that malaria is a disease of the poor and preference of herbal medicine to medical medicine for treating children at home when they have malaria episode because it is cheaper (19.8%). Overall, 2.9% had poor knowledge, majority (87.3%) had fair knowledge and 9.8% had good knowledge.

There are several gaps in the respondents' knowledge relating to malaria and its management in under-five. Therefore, there is need for peer education/training approach in this regard to upgrade mothers' knowledge and skills concerning the treatment, prevention and control of malaria.

Keywords: Under-five, Home management of malaria, Artemisinin Combination Therapy

Word count: 421

CERTIFICATION

I hereby certify that this study was carried out by AKINWALERE, BunmiEjiro in the department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria.

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LIST OF ACRONYMS

ACT	Artemisinin Combination Therapy
AIDS	Acquired Immunity Deficiency Syndrome
AL	ArtemeterLumefantrine
CDC	Center for Disease Control
CMDs	Community Medicine Distributors
DRC	Democratic Republic of Congo
FMOH	Federal Ministry of Health
HBM	Health Believe Model
HIV	Human Immune Virus
HMM	Home-based Malaria Management
ITN	Insecticide Treated Nets
LLINs	Long Lasting Insecticide Nets
MGDs	Millennium Development Goals
NMCP	National Malaria Control Programme
PMV	Patent Medicine Vendors
RBM	Roll Back Malaria
RDT	Rapid Diagnostic Test
UBTH	University of Benin Teaching Hospital
UN	United Nations
UNICEF	United Nations Children's Fund
WHO	World Health Organization
ZMCP	Zanzibar Malaria Control Programm

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study.

Malaria remains one of the world's greatest childhood killers and is a substantial obstacle to social and economic development in the tropics. It is a major cause of morbidity and mortality especially among the vulnerable groups to which children, especially aged less than 5 years belong. (Idro,Otieno,White, Kahindi, Fegan, Ogutu, Mithwani, Maitland, Neville, and Newton C.R.,2007). It was observed that malaria accounts for 25 per cent of infant mortality and 30percent of childhood mortality in Nigeria thereby imposing great burden on the country in terms of pains and trauma suffered by its victims as well as loss in outputs and cost of treatments (WHO,2000).

The parasite responsible for these deaths—Plasmodium falciparum—is transmitted to people when they are bitten (usually at night) by an infected mosquito. In the human body, the parasites reproduce in the liver before invading red blood cells. Here, they multiply again before bursting out and infecting more red blood cells as well as causing a high fever and sometimes damaging vital organs. The transmission cycle is completed when a mosquito bites an infected person and ingests parasites with its blood meal(WHO, 2005).

To reduce the global burden of malaria, this cycle needs to be broken. This can be done in several ways. First, mosquitoes can be controlled with insecticides. Second, individuals can avoid mosquito bites by sleeping under insecticide-treated nets. Finally, antimalarial drugs can be used to reduce the illness and death caused by the malaria parasite and can lessen the likelihood that a mosquito will pick up the parasite when it bites a person. (WHO, 2005). Regardless of the fact that it is one of the oldest recorded diseases, malaria remains one of the world's most deadly infectious diseases. It is arguably, the greatest menace to modern society in terms of morbidity and mortality. Though preventable, treatable and curable, there is no known immunity. Several centuries after its discovery, malaria still remains a devastating human infection, resulting in 300-500 million clinical cases and three million deaths every year. (WHO, 2005).

It is also believed to contribute up to 11 percent maternal mortality, 25 percent infant mortality, and 30 percent under-five mortality. It is estimated that about 132 billion Naira lost to malaria

annually in the form of treatment costs, prevention and loss of work time in Nigeria (FMOH and NMCP, 2009)

Nigeria is known for high prevalence of malaria and it is a leading cause of morbidity and mortality in the country. Available records show that at least 50 percent of the population of Nigeria suffers from at least one episode of malaria each year and this accounts for over 45percent of all outpatient visits. (Ojurongbe, Ogungbamigbe, Fagbenro- Beyioku, Fendel, Kremsner, and Kun, 2007).

Malaria is known to have a negative impact on performance and learning in children according to Holding and Snow (2001). It also aggravates anaemia and malnutrition in children and pregnant women. (Murphy and Breman,2001).

There are strategies being promoted for the management of malaria as a result of the emergence of chloroquine resistance aimed at preventing the occurrence of malaria.The World Health Organization (WHO) currently recommends Artemisinin-based Combination Therapies (ACTs) for malaria control. The use of insecticide-treated nets is also now being strongly promoted. (WHO, 2006). Arigbabuwo, (2010) in his study also opined that prevention is better than cure, advising that people should learn to maintain personal and environmental hygiene.

Mothers have a crucial role to play in recognition, treatment and prevention of malaria in under-five. The knowledge, perception, skills and practices relating to malaria among mothers of under-five in urban settings are yet to be well investigated.This study therefore focuses on knowledge, practices and perception of malaria and its home management using Artemisinin Combination Terapy (ACT)among mothers of under-five in Yemetu one of the communities in Ibadan metropolis.

1.2 Statement of the Problem

In Nigeria, malaria consistently ranks among the five most common causes of death in children. As a result of increased mortality and morbidity there is need for proper understanding of the epidemiology of the disease among the most at risk groups. Nwaorgu, and Orajaka, (2011) Children are more susceptible to malaria attacks during the first five years of life due to their inadequate immunity (Frey, Traore, Allegri, Kouyate and Mueller. 2006; WHO, 2006).

In the year2000, the overall treatment failure of chloroquine was found to be 60% in a 14-d efficacy trial; consequently the Zanzibar Ministry of Health and Social Welfare decided in November 2001 to change both first and second line treatment guidelines for uncomplicated malaria from chloroquine and sulfadoxine-pyrimethamine to Artemisinin-based Combination Therapies (ACT) (ZMCP, 2002).

Falade, Ogundiran and Bolaji (2006), Ajayi (2005), and Ebuehi and Adebajo (2010), opined that most fever occurring in children is first treated at home by mothers and care givers and early recognition and correct management by mothers at home have been shown to impact outcome of the disease positively. However, there is usually inappropriate treatment of malaria at home due to poor knowledge of causation and transmission of malaria as well as types and dosage of drugs used (Ajayi 2005, Falade et al, 2006). The situation leads to deterioration of uncomplicated malaria to the complicated one which often culminates in the death of a very large number of the under-five children (Falade et al (2006)**,** Orimadegun 2010).

In order to ensure proper treatmentand prevention of malaria, studies conducted by Ajayi, Falade, Yusuf, Gbotosho, Iyiola, Olaniyan, Happi, Munguti, and Pagnoni, (2008) noted that, using Artemeter Lumefantrine(AL) at the community level is feasible and likely to give good results provided patients receive clear dosage instructions. However, there is dearth of information relating to consumers' knowledge, practices and perception concerning home management of malaria involving the use of Artemeter Lumefantrine (AL), This is particularly so among mothers of under-five children. This study is therefore designed to investigate the knowledge, practices and perception of malaria and its home management using ACT among mothers of under-five in Yemetu one of the communities of Ibadan metropolies.

1.3 Justification

The rationale behind this study was to document the knowledge and identify practices and perceptions related to malaria.To pinpoint where mothers/caregiver of under-five children are lagging behind in home management of malaria so as to increase level of awareness and sensitization of caregivers where necessary.

Also, this study will help in the adoption of measures that will help in revising existing health policies, increasing funding of health system and enactment of healthy public policies that will be favorable to health system.

Data that will be provided from this study will help in ascertaining valid and valuable information that will help in curriculum review for health care providers relating to home management of malaria.

1.4 ResearchQuestions

a. What is the level of knowledge of under-five mothers about malaria?
b. What is the knowledge of under-five mothers in home management of malaria?
c. What is the practice of mothers of under-five in home management of malaria using Artemisinin-based Combination Therapy (ACT)?
d. What is the perception of mothers of under-five in home management of malaria?

1.5.1 Broad Objectives

The broad objective was assess knowledge, practices and perception of malaria and its home management using Artemisinin-based Combination Therapy (ACT)

1.5.2 Specific Objectives

The specific objectives were to;

a. Assess knowledge of mothers of under-five about malaria
b. Determine the knowledge of home management of malaria among mother of under-five using Artemisinin-based Combination Therapy(ACT)
c. Assess practice of mothers of under-five in home management of malaria using Artemisinin-based Combination Therapy(ACT)
d. Document perception of under-five mothers in home management of malaria

1.6 Meaning of acronyms as used in this study

CMDs: Community Medicine Distributors. They include patent medicine sellers, health-care workers etc.

Under-five children: Children that are below the age of five years i.e. (0-52 month

Mothers of under-five: Mothers of children below age five

Home management; Treatment and care given at home outside the hospital/health Care facility when under-five children have malaria.

CHAPTER TWO

LITERATURE REVIEW

2.1 The Nature of Malaria

Malaria is a life–threatening blood disease caused by parasitic *protozoan* of the genus *plasmodium* transmitted to humans through the bite of the female *anopheles* mosquito. Once an infected mosquito bites a human and transmits the parasites, those parasites multiply in the host liver before infecting and destroying red blood cells. (National Institute of Allergy and Infectious Diseases, 2015).

It was derived from an Italian word for 'bad air'. Malaria is caused by the bites from the female *anopheles* mosquito, which then affect the body with the parasite plasmodium. Female *anopheles* is the only mosquito that can cause malaria, when an infected mosquito bites a human host, the parasite enters the bloodstream and lays dormant within the liver for the next 5-15 days, the host will show no symptoms but the malaria parasite will begin multiplying asexually (NIAID 2015).

According to the World Health Organization (WHO, 2015), there are more than 100 types of plasmodium parasites, which can affect variety of species. Also, Centre for Disease Control and Prevention (CDC, 2015) reported that scientist have identified five types of plasmodium (P) that specifically affect human they include:

P. falciparum- located worldwide in tropical and sub-urban areas, but predominately in Africa. An estimated 1million people are killed by this strain every year. The strain can multiply rapidly and can adhere to blood vessels walls in the brain, causing rapid unset of severe malaria including cerebral malaria

P. vivax- located in Latin America, Africa, and Asia, it is arguably the most widespread due to the high population of Asia. This strain has a dormant liver stage that can activate and invade the blood after months or years, causing many patients to relapse

P. ovale- located mainly in West Africa, it is biologically and morphologically very similar to specie *p. vivax*. However, unlike *p. vivax*, this strains can affect individuals who are negative with

the Duffy blood group, which is the case for many residents of sub-Saharan African. This explains the greater prevalence of *p. ovale* (rather than *p. vivax*) in most of Africa.

P. malariae- located worldwide and the only human parasite to have a three-day cycle. If left untreated,*p. malariae* can cause a long lasting, chronic infection that can last a lifetime and which may cause nephrotic syndrome

P. knowlesi- located in Southeast Asia and associated with *macaques* (a type of monkey). This strain has a 24hours cycle and can, therefore, multiply rapidly once a patient is infected, causing an uncomplicated case to become serious very quickly. Fatal cases of infection with the strain can be reported. (CDC, 2015).

According to the Centers for Disease Control and Prevention (CDC), malaria symptoms can be classified in two categories: uncomplicated and severe malaria.

Uncomplicated malaria is diagnosed when symptoms are present, but there are no clinical or laboratory signs to indicate a severe infection or the dysfunction of vital organs. Individuals suffering from this form, can eventually develop malaria if the disease is left untreated, or if they have poor or no immunity to the disease.

Symptoms of uncomplicated malaria typically last 6-10 hours and occur in cycle that occur every second day, although some strains of the parasite can cause a longer cycle or missed symptoms. Symptoms are often flu-like and may be undiagnosed or misdiagnosed in areas where malaria is less common. In area where malaria is common, many patient recognize the symptoms as malaria and treat themselves without proper medical care.

Uncomplicated malaria typically has the following progression of symptoms through cold, hot and sweating stages.

i. Sensation of cold, shivering
ii. Fever, headaches, and vomiting (seizures sometimes occur in young children)
iii. Sweats followed by a return to normal temperature, with tiredness

Severe malaria is defined by clinical or laboratory evidence of vital organ dysfunction. This form has the capacity to be fatal if left untreated. As a general overview, symptoms of severe malaria include: fever and chills, impaired consciousness, prostration (adopting a prone or prayer position),

multiple convulsions, deep breathing and respiratory distress, abnormal bleeding and signs of anemia and clinical jaundice and evidence of vital organ dysfunction. (CDC, 2015).

2.2 Recognition and Management of Malaria.

Early diagnosis of malaria is critical for a patient's recovery. Any individual showing signs of malaria should be tested immediately. The WHO strongly advise parasitological confirmation by microscopy or a rapid diagnostic test (RDT)(WHO, 2015).

RDTs are increasingly used as health care professional seek to not only improve testing methodologies, but also to ensure that the opportunity for testing reaches a wider coverage audience. The number of RDTs distributed by national malaria control programs around the world has increased substantially. In 2005, less than 200,000 RDTs were provided, in 2012 this number had risen to 108million. (WHO 2015).

The artemicinin group of drugs was discovered in china, a crude extract of wormwood plant *artemisa annua* (ginghao) an herb employed in chinese traditional medicine was first used as an antipyuretic 2000 years ago, and its specific effect on the fever of malaria was identified and purified in the 1970 and named ginghao or artemicinin, and possess the most rapid action of all drugs against *Plamodium falciparum* malaria (White, 1997).Artemisinin was first discovered by Tu Youyou, a Chinese scientist, who was awarded half of the 2015 Nobel Prize in Medicine for her discovery (Nobel foundation, 2015). Treatment containing an artemicinin derivative (ACTs) are now standard treatment worldwide for *P. falciparum* malaria. Use of the drug by itself as a monotherapy is explicitly discouraged by the WHO as there have been signs that malaria parasites are developing resistance to the drug. Therapies that combine artemicinin or its derivatives with some other anti-malarial drug are the preferred treatment for malaria and are both effective and well tolerated in patients (WHO, 2006).

According to Gary, Micheal, Parkers, John, Jeffrey, Ploypradith, Shapiro, and Theresa (1999), because the physical properties of artemicinin itself, such as poor bioavailability, limit its effectiveness and semi-synthetic ability. As such, derivatives of artemicinin have been deployed. These include:Artesunate (water-soluble: for oral, rectal, intramuscular, or intravenous use), Artemether (lipid-soluble: for oral, rectal or intramuscular use), Dihydroartemicinin, Artelic acid andArtemotil. If left untreated, malaria can be fatal. The aim of the treatment is to eliminate the

plasmodium parasite from the patient blood stream. Even those who are asymptomatic may be treated for infection so as to reduce the risk of disease transmission in the general populace. Hence, Artemisinin-based Combination Therapy (ACT) is recommended by the WHO for the treatment of uncomplicated malaria.

ACT is Artemicinin combined with a partner drug. The role of artemicinin is to reduce the number of parasite within the first three days while the partner drugs eliminate the rest. However, there is growing concern about the increase of cases of malaria resistant to the effect of ACTs. As of February 2015, artemicinin resistance has been confirmed in five countries, namely: Cambodia, Laos, Myanmar, Thailand and Vietnam. For these cases, individuals were still successfully treated, but the ACT must contain an effective partner drug. (WHO, 2015)

2.3 Burden of Malaria

According to the latest WHO estimates, released 1st November 2015, there were 214 million cases of malaria in 2015 and 438,000 deaths. Between 2000 and 2015, malaria incidence among population at risk fell by 37% globally, during the same period, malaria mortality rates among populations at risk decreased by 60%. An estimated 6.2million malaria deaths have been averted globally since 2001. Sub-Saharan Africa continues to carry a disproportionately high share of the global malaria burden. In 2015, the region was home to 88% of malaria cases and 90% of malaria deaths. Some 15countries- mainly in sub- Saharan Africa- account for 80% of malaria cases and 78% deaths globally. Since 2000, the decline in malaria incidence in these 15 countries (32%) has lagged behind that of other countries globally (15%). In areas with high transmissions of malaria, children under five are particularly susceptible to infection, illness and death; more than two thirds (70%) of all malaria deaths occur in this age group. Between 2000 and 2015, the under-5 malaria death rate fell by 65% globally translating into an estimated 5.9million child lives saved between 2001 and 2015 (WHO Malaria Fact Sheet, 2016).

Thirty countries in Sub-Saharan Africa account for 90% of global malaria deaths. Nigeria, Democratic Republic of Congo (DRC), Ethiopia, and Uganda account for nearly 50% of the global malaria deaths. Malaria is the 2nd leading cause of death from infectious diseases in Africa, after HIV/AIDS. Almost 1 out of 5 deaths of children under-5 in Africa is due to malaria (Report of the United States Embassy in Nigeria, 2011).

Poor people are at increased risk both of becoming infected with malaria and of becoming infected more frequently. Child mortality rates are known to be higher in poorer households and malaria is responsible for a substantial proportion of these deaths. In a demographic surveillance system in rural areas of the United Republic of Tanzania, under-5 mortality following acute fever (much of which would be expected to be due to malaria) was 39% higher in the poorest socioeconomic group than in the richest (Gambia Roll back Malaria Program, 2001). A survey in Zambia also found a substantially higher prevalence of malaria infection among the poorest population groups, resulting from poor families live dwellings that offer little or no protection against mosquitoes, and that are less able to afford insecticide-treated nets (Akazili, 2002). Poor people are also less likely to be able to pay either for effective malaria treatment or for transportation to a health facility capable of treating the disease ((Akazili, 2002).

Both direct and indirect costs associated with a malaria episode represent a substantial burden on the poorer households. A study in northern Ghana found that the cost of malaria care was just 1% of the income of the rich, while it was 34.0% of the income of poor households (Breman, 2001). As such, the poor suffers much of the burden of the disease.

2.4 Malaria in Nigeria

Malaria remains a serious public health challenge and causes death and illnesses in children in Nigeria (Uzochukwu et al., 2010). Prevalence of malaria in Nigeria varies by weather, which affects the ability of the main carrier of malaria parasites, anopheles mosquitoes, to survive. Tropical areas including Nigeria have the best combination of adequate rainfall, temperature and humidity allowing for breeding and survival of anopheles mosquitoes.

Report byNigeria Malaria Fact Sheet, United States Embassy in Nigeria (2011) showed that malaria is a major public health problem in Nigeria, where it accounts for more cases and deaths than any other country in the world. Malaria is a risk for 97% of Nigeria's population. The remaining 3% of the population live in the malaria free highlands. There are an estimated 100 million malaria cases with over 300,000 deaths per year in Nigeria. This compares with 215,000 deaths per year in Nigeria from HIV/AIDS, contributing to an estimated 11% of maternal mortality **(**Malaria Report ofUnited States Embassy in Nigeria, 2011). According to the same report of the United States Embassy in Nigeria,Malaria accounts for 60% of outpatient visits and 30% of

hospitalizations among children under-five years of age in Nigeria. As such, it has the greatest prevalence, close to 50%, in children age 6-59 months in the South West, North Central and North West regions, while it has the least prevalence, 27.6 percent, in children age 6 to 59 months in the South East region.

Malaria has remained a major public health issue in Nigeria, Federal Ministry of Health (FMOH) reports Nigeria accounts for one quarter of all malaria cases in Africa, one of the world's highest rates of all cause -mortality for children under-five, and about one in six children die before their fifth birthday (FMOH, 2012). This fact was established according to the research carried out in Cross River State showing that under-five mortality of 176 per 1000 births and in Cross River State under-five mortality of 176 per 1000 births and infant mortality of 120 per 1000 births, placing Cross River among those with the highest child deaths in the country (State Ministry of Health, 2010), and malaria prevalence of 19.8% (National Population Commission, 2009). Hence, the malaria control targets include 100% children under five years and pregnant women to use mosquito nets by 2015 (Community Health Department, 2013). Because of drug resistance, Nigeria changed the drug regimen of choice for uncomplicated malaria from chloroquine to artemisinin-based combination therapy (ACT), preferably Artemether–lumefantrine (AL) in 2005.

Through the home management of malaria strategy, the country's Federal Ministry of Health is introducing AL for distribution by the informal sector at the community level outside health facilities (Federal Ministry of Health 2005). The National Malaria Control Program (NMCP) is progressing with increased funding from the Global Funds for AIDS, Tuberculosis and Malaria. Governments are working toward achieving five-year strategic targets: increase by 80% households with average of two insecticide treated nets (ITNs) by 2010 and sustain coverage by 2013; 100% of pregnant women attending ante natal clinic two or more doses of intermittent preventive treatment by 2013. Others are increase by 80% children under five years sleeping under ITN by 2010 and sustain by 2013; and increase by 80% persons treated with effective anti-malaria within 24 hours of symptom by 2013 (FMOH, 2012). National minimum package for malaria control include availability of insecticide treated nets for every pregnant woman and child under five years; use of artemisnin based combination therapy (ACT) for uncomplicated malaria. Institutionalizing case management; and use of sulphaoxine-pyrimethamine for intermittent prevention in pregnant women (FMOH, 2007).

2.5 Malaria among Under-Five

The increased malaria-related morbidity and mortality, especially in children under the age of 5 years (under5), due to emerging resistance of Plasmodium falciparum to conventional antimalarial drugs calls for immediate actions to ‘‘Roll Back Malaria’’ in Sub-Saharan Africa. This need has been clearly recognized in the Millennium Development Goals ‘‘to halt and begin to reverse malaria incidence’’ UN (2000) as well as in the Abuja Declaration objective to halve malaria mortality in Africa by 2010 through implementation of combined control strategies WHO (2000). This is because African children under five years and pregnant women are most at risk of malaria. Fatally afflicted children often die less than 72 hours after developing symptoms. In those children who survive, malaria drains vital nutrients from them impairing their physical and intellectual development (WHO. 1998). Malaria remain a major impediment to health in Sub Saharan Africa, and its greatest toll is among under-five children and pregnant women as earlier said, It remains the single biggest cause of death among young children in Africa (WHO/UNICEF Africa Malaria Report 2003).

Research has shown an estimated 584,000 malaria death around the world in 2003, of which approximately 78% were in children under five years of age. In high transmission areas, partial immunity to the disease is acquired during childhood. In such settings, the majority of malaria disease, and particularly disease with rapid progression to death, occur in young children without acquired immunity. Severe anemia, hypoglycemia and cerebral malaria are features of severe malaria more commonly seen in children than in adults. (WHO Malaria Fact Sheet 2016).

Malaria is the fifth leading cause of death worldwide, second leading cause of death in Africa, and almost half of the world population is at risk (WHO, 2010), It kills large number of African children each year and blights the life of many million, every 30 seconds a child dies from malaria in Africa (UNICEF, 2009).

Hogan and Adind (2013) recognizes Malaria as a serious public health problem worldwide , yet preventable and treatable. However, in 2010 the disease killed an estimated 660, 000 people largely children under five years in sub-Saharan Africa; the Republic of Congo and Nigeria account for mo re than 40% of estimated global malaria deaths (WHO, 2013). Federal Ministry of Health (FMOH) reports Nigeria accounts for one quarter of all malaria

cases in Africa, one of the world's highest rates of all cause -mortality for children under five, and about one in six children die before their fifth birthday (FMOH, 2012). In Cross River State under five mortality of 176 per 1000 births and infant mortality of 120 per 1000 births, placing Cross River among those with the highest child deaths in the country (State Ministry of Health, 2010), and malaria prevalence of 19.8% (National Population Commission, 2009). Hence, the malaria control targets include 100% children under five years and pregnant women to use mosquito nets by 2015 (Community Health Department, 2013).

Ashikeni, Envuladu and Zoakah (2013) also noted that Malaria remains a huge public health problem in African countries and accounts for 10% of its disease burden even though it is both preventable and curable. During their research conducted among 232 mothers/ caregivers of under-five children selected through a two staged sampling technique by balloting in Kuje and Rubochi community in Kuje Area Council of the Federal Capital Territory they found out that Mothers of children under five in Kuje had poor knowledge of the cause of malaria and its prevention method, and were not using the recommended drug by the Federal Government of Nigeria (ACTs) for the treatment of uncomplicated malaria and Chloroquine which had been reported to have growing resistance in most parts of the country was still in use by majority of the women. However adequate health education to women especially in the language they understood effectively increased their knowledge and improved the practice of the treatment of malaria in children.

It was exposed more by Nyamongo, (2002) that infants in warm climate, dirty environments with pools of water and unprotected homes are highly at risk of mosquito bites. However, most cases of malaria do not present at health facilities and mothers tend to try other remedies before taking children to the hospital. Cultural beliefs and practices lead to self-care, home remedies, and use of traditional healers in rural communities .

Seasonal malaria chemoprevention for infants is now possible. World Health Organization recommends intermittent preventive treatment through immunization, an estimated 28million infants could benefit from preventive therapy, yet only Burkina Faso has adopted this simple, safe and effective procedure (WHO, 2013). Effective treatment of malaria within 24 hours from onset of symptom helps to prevent life threatening complications. Unfortunately, most child hood deaths from severe malaria are often due to delay in prompt treatment and use

of other remedies by mothers before taking the child to a health facility. Hence, effective management of malaria in children under- five years requires mothers to seek help promptly, obtain, and apply anti-malaria drugs. The WHO (2006) argues use of insecticide treated nets is effective in preventing malaria, and regular use could reduce under-five mortality rate by 30% in endemic environments, particularly long lasting insecticide nets. In addition, due to increasing level of mosquito resistance to anti-malaria drugs, the World Health Organization recommended the use of combination rather than mono-therapy. Malaria control requires integrated approach, prevention, access to treatment, and prompt treatment with effective drugs.

Shunmay, Pongtavornpinyo, Hastings, Mills, and White (2004) focused on the increasing resistance of Plasmodium falciparum malaria to antimalarial drugs is posing a major threat to the global effort to "Roll Back Malaria". Chloroquine and sulfadoxine-pyrimethamine (SP) are being rendered increasingly ineffective, resulting in increasing morbidity, mortality, and economic and social costs. One strategy advocated for delaying the development of resistance to the remaining armory of effective drugs is the wide-scale deployment of artemisinin-based combination therapy. However, the cost of these combinations are higher than most of the currently used monotherapies and alternative non-artemisinin−based combinations. In addition, uncertainty about the actual impact in real-life settings has made them a controversial choice for first line treatment. The difficulties in measuring the burden of drug resistance and predicting the impact of strategies aimed at its reduction are outlined, and a mathematical model is introduced that is being designed to address these issues and to clarify policy options. Resistance to antimalarial drugs is resulting in avoidable morbidity, mortality, and financial losses. Urgent measures are needed now to reduce the current and future burden of disease. There is little justification for the continued use of ineffective drugs because effective drugs are currently available. The decisions of which drug regimen to change to, and how to implement the change in a way that maximizes potential benefit, are more difficult, but delaying a decision to switch because of these difficulties can only result in increased morbidity and mortality. Furthermore, delaying a switch to ACTs potentially puts at risk one of the key advantages of this strategy, which is to delay the emergence of resistance.(Shunmay, Pongtavornpinyo *et al.*,2004).

The longer the decision is delayed, the more entrenched will become the unregulated use of the artemisinin and partner drugs as monotherapies. Partly because of the uncertainties, there is still

significant reluctance to take action amongst potential funders and some national governments, both of whose commitment is essential for the success of any change in policy. By developing a bio-economic model that incorporates realistic drug, parasite, host immunity, behavioral, and economic factors, we hope to contribute a useful tool to this debate. The model is currently being refined so that key relationships are elucidated, particularly those relating to the relationships between carrying a resistant genotype, adherence to treatment, and outcome in terms of duration of illness and cure. To clarify the importance of uncertainties and the relative importance of such factors as coverage and adherence, extensive sensitivity analysis is being undertaken. The key objective is to produce a rational and transparent frame-work that can be used as a tool for the planning and evaluation of changes in drug policy and implementation strategies.

Achuyt, Abdullah, Kachur, Andreas, Ali K, Rashid, Abdul-wahiyd, Mahdi, Guida, Gerstenmaier, Fabrizio Molteni, Salim Abdulla, Scott M. Montgomery, Akira Kaneko1, Anders and Bjorkman.(2007)contributed by saying that The Roll Back Malaria strategy recommends a combination of interventions for malaria control. Zanzibar implemented artemisinin-based combination therapy (ACT) for uncomplicated malaria in late 2003 and Long-Lasting Insecticidal Nets (LLINs) from early 2006. ACT is provided free of charge to all malaria patients, while LLINs are distributed free to children under the ages of five and pregnant women. They investigated temporal trends in Plasmodium falciparum prevalence and malaria-related health parameters following the implementation of these two malaria control interventions in Zanzibar.

2.6 Home management of malaria in under-five by mothers/care givers

Malaria is the main cause of fever in children less than five years of age. Early diagnosis and appropriate treatment are essential to reduce morbidity and mortality related to malaria among this group (WHO/EMRO, 2005). Effective treatment of malaria in children under the age of five requires mother/caregiver to seek, obtain and use medication appropriately. Home-based management of Malaria (HMM) is the process by which clinical cases of fever in the under-fives can be recognized and treated at home by their mothers or care givers and sometimes they are assisted by community health workers or medicine distributors (Nzayirambaho, Bizimana, Freund, Millet, Merrien, Potel, Lombrail,. 2010.). HMM offers antimalarial treatment to young children with fever (Nsabagasami, Jesca-Nsungwa-Sabiiti, Kallander, Peterson, Pariyo, and Tomson (2007) Thiam *et al.*,2012). This is because Children develop severe malaria with high mortality

risk very rapidly therefore, HMM is a necessity where prompt effective treatment is crucial (Nsabagasami *et al.,* 2007). Hence, Since January 2005, the Nigerian Malaria Control Programme (NMCP) recommended the use of Artemisinin-based combination therapy (ACTs) as first line treatment of uncomplicated malaria. (Uzochukwu*et al.,* 2008). Also in high and moderate malaria transmission areas where infection is common, the WHO recommends that all children under the age of five with fever should be treated with effective antimalarial medicines based on a clinical diagnosis. (WHO/UNICEF 2003, Obionu and Federal Ministry of Health 2006-2010).

This is because effective treatment of malaria within 24 hours from onset of symptom helps to prevent life threatening complications. Unfortunately, most childhood deaths from severe malaria are often due to delay in prompt treatment and use of other remedies by mothers before taking the child to a health facility.

Hence, effective management of malaria in children under- five years requires mothers to seek help promptly, obtain, and apply anti-malaria drugs. WHO (2006) argues use of insecticide treated nets is effective in preventing malaria, and regular use could reduce under-five mortality rate by 30% in endemic environments, particularly long lasting insecticide nets. In addition, due to increasing level of mosquito resistance to anti-malaria drugs, the World Health Organization recommended the use of combination rather than mono-therapy. Because Malaria control requires integrated approach, prevention, access to treatment, and prompt treatment with effective drugs. Also, because the clinical condition of children with malaria can deteriorate rapidly, there should be a low threshold for the use of parental treatment. Recent data support the use of intravenous artesunate in preference to quinine for the treatment of severe malaria in children. (WHO 2006)

2.7 Knowledge of under-five mothers in treatment of malaria

Falade, Ajayi, Yusuf, and Pagnoni, (2014).and Jombo, Mbaawuaga, Denen, Alao, Peters, Dauda, Okwori, Akosu, Etukumana, and Yaakugh (2010) in their study observed thatcorrect knowledge of current antimalarial drugs available for malaria treatment by Nigerians has a significant impact on the overall success of the ongoing national malaria control programme. This is as a result of a large segment of the communities, who more often than not, rely on self-medications or as care givers influence the choice drugs for malaria treatment for their wards. They therefore concluded that the study has shown that illiteracy and economic factors were largely responsible for the

people's resolve to self-medication for malaria and attendant to wrong choices of drugs to treat the disease. Policy formulators and implementers should seriously consider the possibility of introducing community drug distributors and home based managers for commencement of intermittent preventive treatment of malaria in the community as well as stepping up enlightenment and awareness campaigns about malaria so as to establish the new approach towards elimination of the disease from the community. It has also been said that where there is a serious case of malaria in a child, Artesunate should be administered rectally and the child transferred to a facility for full parental treatment. A single dose of rectal Artesunate as preferred treatment reduces the risk of death in children when the time for referral exceeds 6hours (WHO, 2015).

Adeneye, Jegede, Mafe and Nwokocha (2013) also examined the extent to which HMM has raised the ability in promptly recognizing and treating malaria at home. Their study showed that lack of awareness was the major reason for non-use of ACTs in HMM. Locality, age, and education significantly determined awareness and use of ACTs and LLIN. Adeneye, Jegede, Mafe and Nwokocha (2013) therefore suggested that adequate information and stock of ACTs and LLINs should be made available and accessible for the RBM and MDG targets to be realized in the study communities.

It is apparent that the low level of ACT use in home management of malaria as demonstrated in the study appears to provide an optimistic foundation for future wider acceptance and use in the communities; there is, however, the need for caution. This is because there could be possible miss-diagnosis and management of malaria for other febrile illnesses at home thereby contributing to over-diagnosis of malaria and irrational use of anti-malarial which has the potential for facilitating resistance to these drugs by greatly increasing the number of people who are treated unnecessarily but will still be exerting selective pressure on the circulating parasite population as emphasized by Oliver et al (1991),

2.8 Practices of under-five mothers towards use of ACT

Falade, Ajayi, Yusuf, and Pagnoni (2014) found that Artemeter Lumefantrine (AL) was well accepted, effective, and safe when used at the community level in southeast Nigeria, and that,investing to improve and sustain treatment adherence, providing incentives to CMDs and strengthening the health system should be integral to scalling up of ACT use for the home

management of malaria in Nigeria and beyond.The WHO recommends that in high and moderate malaria transmission areas where infection is common, all children under the age of five with fever should be treated with effective antimalarial medicines based on a clinical diagnosis. (Obionu 2007; WHR 1999 and FMOH, 2005).

One major factor that affects effective home management is the large number of uneducated mothers that suggests the large variations in the administration of the drugs bought over the counter as most of the vendors are not professional pharmacists who can prescribe the correct dosage. Chukwocha (2011) reported ignorance, use of fake drugs and wrong diagnosis as some of the factors hindering effective home management of malaria in Nigeria. Jumbo, Mbaawuaga, Denen, Alao, Peters, Dauda, Okwori, Akosu, Etukumana and Yaakugh (2010). Also observed in their study that correct knowledge of current antimalarial drugs avaikable for malaria treatment by Nigerians has a significant impact on the overall success of the ongoing National Malaria Control Programme (NMCP).this is as a result of a large segment of the communities, who more often than not, rely on self-medication or as care givers influence the choice drug for malaria treatment in their wards. Leading to their conclusion that illiteracy and economic factors were largely responsible for self-medication for malaria and use of wrong choices of drug to treat the disease.

Also,Ajayi, Peter-Albert, Olasehinde, Adejuwon, and John–Dewole, (2014) in their study deduced that HMM is not being practiced correctly in communities many of the caregivers end up in hospitals due to inappropriate dosage of anti-malarial drugs. A large percentage of the caregivers take traditional treatments. Many caregivers of children under five years do not possess adequate knowledge on the control and treatment of malaria. There is paucity of information on the use of HMM and therefore the need for urgent intervention to improve HMM, organize programmes to sensitize the local communities on the way forward in HMM.

Ajayi, Peter-Albert *et all* (2014) therefore, concluded that Poor malaria treatment practice heightened by poor awareness and low use of LLINs and ACTs in HMM below RBM targets was found in their study. Adequate RBM commodities with particular focus on LLINs and ACTs, and information through health promotion package need be made available and accessible for mothers and other care-givers of children under five years for the RBM targets of the HMM component and the MDG on malaria to be realized in communities.

Adeneye, Jegede, Mafe, and Nwocha (2013) also examined extent to which HMM has raised the ability in promptly recognizing and treating malaria at home. Their study showed that lack of awareness was the major reason for non-use of ACT in HMM. Locality, age, and education significantly determined awareness and use of ACTs and LLIN. They therefore suggested that adequate information and stock of ACT and LLIN should be made available and accessible for the RBM and MDG targets to be realized in the study communities

2.9 Knowledge of usageof ACT (Arthemeter Lumefantrine) byunder-fivemothers

Because of drug resistance, Nigeria changed the drug regimen of choice for uncomplicated malaria from chloroquine to artemisinin-based combination therapy (ACT), preferably Artemether–lumefantrine (AL) in 2005. Through the home management of malaria strategy, the country's Federal Ministry of Health is introducing AL for distribution by the informal sector at the community level outside health facilities (FMOH 2005). For one thing, introducing AL is costly and the dosage regimen is complicated, both of which can lead to poor treatment adherence. But fortunately, some malaria rapid diagnostic tests, which are recommended for establishing the diagnosis, especially in rural areas, have shown high sensitivity and specificity and can be reliably performed by community health workers after minimal training. (Harvey, Jennings, Chinyama, Masaninga, Mulholland, Bell,Mayxay, Newton, Yeung, Pongvongsa, Phompida, and Phetsouvanh, 2008).

A study carried out by Depoortere, Guthmann, Sipilanyambe, Nkandu, Fermon, Balkan, (2004) showed that adherence to full treatment with ACT in the home management of malaria strategy has been a major concern, especially because of the twice daily dose of AL for three days.

Effective training, supervision, provision of a treatment guideline, absence of serious adverse events, community mobilization and commitment are additional factors that could contribute to high treatment adherence and acceptance to AL at home/community level. This is because previous intervention, training carried out by Ajayi, (2006): and Källander, Hildenwall, Waiswa, Galiwango, Peterson, Pariyo, (2008) was found to have positively influenced adherence to chloroquine in the home management of malaria.

In summary, AL was found to be well accepted, effective and safe when used at the community level in Ona-ara LGA in south-west Nigeria. Investing to improve and sustain treatment adherence,

providing incentives to CMDs and strengthening the health system should be integral to the scaling up of ACT use for the home management of malaria in Nigeria. Ajayi, Falade, Yusuf, Gbotosho, Happi, Pagnoni (2009)

According to a research carried out by Ashikeni, Envuladu and Zoakah (2013) their study on Perception and practice of malaria prevention and treatment among mothers, showed that the mothers of children less than five years in Kuje had poor knowledge of the cause of malaria, its prevention and possible complications. They were also not using the drug recommended by the Federal government of Nigeria for the treatment of malaria (ACTs); and still using Chloroquine which had been reported to have growing resistance in most parts of the country was still in use by majority of the women. This study showed that adequate and proper health education to women especially in the language they understood increased their knowledge and improved their practice of the treatment of malaria in children.

2. 10 Factors Militating Against Uptake of Atemisinin-based Combination Therapy

Traditional factor

Caretakers sought care for cases of malaria from different types of health care providers depending principally on their perceptions and beliefs regarding the illness. For example, in a study conducted by Makundi, Malebo,Mhame, Kitua, and Warsame, (2006) found that caretakers who associated malaria to evil spirits sought care outside the modern health sector. In addition, other caretakers, upon recognition of symptoms, first responded to the illnesses by employing traditional care at home.It was also shown in their research that, where necessary, traditional home management practices employed bycaretakers included placing the child under bed,sponging or washing the child with cold water, and urinating on the ill child were among the practices adopted.

Poor knowledge : Maslove, Mnyusiwalla, Mills, and Gowan (2009) in their study found that insufficient understanding of the cause and transmission of malaria, the belief that malaria cannot be prevented, and the use of inefficient prevention practices were the most reported barriers to the effective prevention of malaria especially in children.

Accessibility to health care services: In availability, delay in medical care and adherence to prescribed medical medications are some of the factors that militate against effective uptake of

artiemicinin-based combine therapy. Health care seeking behavior and socio-economic status, determines access to health care services, which affect the utilization of health care services in developing countries around the world (Getahun, Deribe, and Deribew,(2010)Studies have shown that prompt and appropriate treatment of suspected cases of childhood malaria close to the home can remarkably reduce malaria morbidity and mortality. Eckert, (2004): andPagnoni, Convelbo, Tiendrebeogo, Cousens 2007).

Delay in treatment: Effective treatment of malaria within 24 hours from onset of symptom helps to prevent life threatening complications. Unfortunately, most childhood deaths from severe malaria are often due to delay in prompt treatment and use of other remedies by mothers before taking the child to a health facility.Hence,effectivemanagement of malaria in children under- five years requires mothers to seek help promptly, obtain, and apply anti-malaria drugs**.**

2.11Theoretical Framework

Miles and Huberman (1994) defined a conceptual framework as a visual or written product, one that explains either graphically or in narrative form, the main things to be studied, the key factors, concept or variables and the presumed relationships among them. Hence the conceptual framework of a study is the system of concepts, assumptions, expectations, beliefs and theories that support and inform your research (Miles and Huberman & 1994; Robson, 2011).

Health Belief Model (HBM) will be used for this study: Health belief model (HBM) was one of the first theories of health behavior, and remain one of the most w widely recognized in the field. It was developed in 1950s by a group of U.S Public Health Service social psychologist who wanted to explain why so few people were participating in programs to prevent and detect disease. For example, the Public Health Service was sending mobile X-ray unit out to neighborhood to offer free chest X-rays (screening for tuberculosis). Despite the fact that the service was rendered free of charge in a variety of different locations, the program was of limited success. The question was why? To find an answer, social psychologists examined what was encouraging or discouraging people from participating in the program. They theorized that people's beliefs about whether or not they were susceptible to disease, and their perceptions of the benefits of trying to avoid it, influenced their readiness to act.

In ensuing years, researchers expanded upon this theory, eventually concluding that six (6) main construct influence people's decision about whether to take action to prevent, screen for, and control illness. They are argued that people are ready to act base on the six construct:

Perceived Susceptibility: Perceived susceptibility refers to beliefs about the likelihood of getting a disease or condition. Mothers of under five children may have a low susceptibility towards getting malaria due to various reasons. For example, many mothers believe malaria is a spiritual attack and as long as they pray, their children cannot get malaria.

Perceived Severity: When people believe a disease condition has serious consequences. Feelings about the seriousness of contracting an illness or of leaving it untreated include evaluations of both medical and clinical consequences (for example, death, disability, and pain) and possible social consequences (such as effects of the conditions on work, family life, and social relations). The combination of susceptibility and severity has been labeled as perceived threat.

Perceived Benefit: When they believe taking action would reduce their susceptibility to the condition or its severity. Even if a person perceives personal susceptibility to a serious health condition (perceived threat), whether this perception leads to behavior change will be influenced by the person's beliefs regarding perceived benefits of the various available actions for reducing the disease threat. Other non-health-related perceptions, such as the financial savings related to quitting smoking or pleasing a family member by having a mammogram, may also influence behavioral decisions. Thus, individuals exhibiting optimal beliefs in susceptibility and severity are not expected to accept any recommended health action unless they also perceive the action as potentially beneficial by reducing the threat.

Perceived Barrier: When they believe cost of taking action are outweighed by the benefit. The potential negative aspects of a particular health action. Perceived barriersmay act as impediments to undertaking recommended behaviors. A kind of non-conscious, cost-benefit analysis occurs wherein individuals weigh the actions expected benefits with perceived barriers.Perceived barriers is an individual's perception of the difficulties stopping them from following a specific health-related behaviour. The desire to take malaria treatment is hindered by existing socio-cultural factors which include values, belief, gender role, distance to health care facilities, socioeconomic status.

Cue to Action: When they are exposed to actions e.g., a television, physical contact with somebody with an illness or a reminder from one's physician will enable an under-five mother to adopt a treatment action. Various early formulations of the HBM included the concept of cuesthat can trigger actions. Hochbaum (1958), for example, thought that readiness totake action (perceived susceptibility and perceived benefits) could only be potentiated by other factors, particularly by *cues* to instigate action, such as bodily events,or by environmental events, such as media publicity. He did not, however, study therole of cues empirically. Nor have cues to action been systematically studied. Indeed,although the concept of cues as triggering mechanisms is appealing, cues to actionare difficult to study in explanatory surveys; a cue can be as fleeting as a sneeze orthe barely conscious perception of a poster.

Self-Efficacy: When they are confident in their ability to successfully perform an action. Self-efficacyis defined as "the conviction that one can successfully execute the behavior required to produce the outcomes.

In applying this model to this study, the tenets of HBM, perceived susceptibility will help pinpoint why the respondents think they are or they are not susceptible to malaria, may be they think malaria is a disease of the poor, or maybe malaria affects certain group of people only.

The study will also reveal how severe the respondents think malaria can be. May be it can actually lead to death or not or may be it can lead to complications which can actually make them take preventive measures like ensuring clean environment, use of ITN etc.

Perceived benefits will tell us why the respondents think it is beneficial to prevent malaria, do they even see it as been beneficial to prevent malaria? It will help to probe more on their knowledge and perception of the importance of preventing malaria.

The barriers or factors that prevent respondents from making use of home management of malaria will also be identified. Some of this factors could be religious, cultural, environmental etc. for example when an individual believe malaria is caused by witches and wizard, care will definitely be sought through traditional means.

Those things that will prompt the respondents to act (cues to action) when their children have malaria will also be revealed by the study. It may be their encounter with somebody who has

malaria or malaria actually killed someone they know. It may also be that they have seen a case of complicated malaria somewhere or they may not even take any action because they thinks when somebody they known had malaria, it disappear itself without treatment.

Self-efficacy will tells us how efficient respondents think they are e.g. their efficacy was high when they know the right/correct dosage for ACT and paracetamol and low when they are not conversant with the correct dosage of ACT.

Conceptual framework

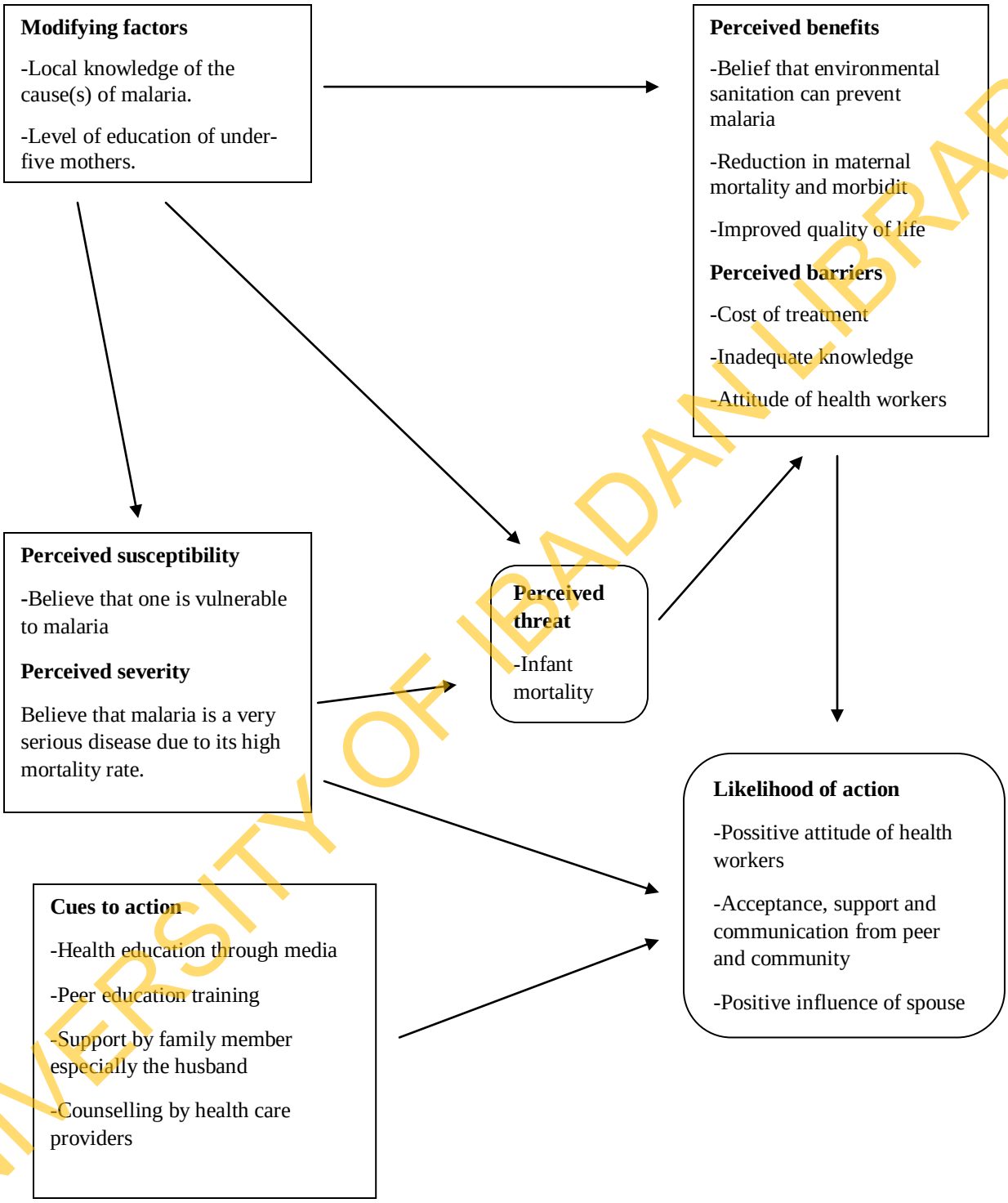

Figure:2.1:Conceptual framework showing the application of Health Belief Model to the research.

CHAPTER THREE

METHODOLOGY

3.1 Study Design

The study was adescriptive cross-sectional survey which involved the use of the quantitative method in Yemetu community of Ibadan North Local Government area, Oyo State.

3.2 Description of Study Area

Yemetu is a community located in Ibadan North Local Government Area (LGA) in ward 3. of Oyo State. It has a total population of 65,949.The total number of under-five children is 13,190.(National Population Commission, 2006.)

The community is located on a hilly ground and the soil is granite in nature.The community is ancient as majority of the houses and buildings were inhabited largely by indigenous population.Core areas of the community is highly densed thereby preventing dwellers access to cross ventilation. Some areas of the street are hilly making it difficult for inhabitants in the valley side of the community to have access to well reservoir in the community since not all the houses could afford digging a well.

The main disease burden in the community is malaria. The community lack proper drainage channel and sewage disposal system.Also, the inhabitants are fond of dumping refuses around their houses and emptying sewage into drainage channels thereby giving rise to continuous breeding of mosquito. The issue of malaria in the area kept increasing because much breeding spaces are being created through wastes kept undisposed before the arrival of the sanitation team for packing of the waste. Other disease burden include diarrhoea, typhoid, out of which malaria is the most pressing.

The community had three (3) health facilities: A government owned secondary health facility called Adeoyo Maternity Teaching Hospital, and two private health facilities namely Kola Daisi Foundation Center (for primary and community health) and Vine Branch Medical Clinic which are accessible to the people in the community. The first teaching hospital in Nigeria, University College Hospital is located close to Yemetu community. There are pharmaceutical stores and Patent Medicine Vendors (PMVs.) that help in providing various health care services for the

people. The inhabitants however, patronizes PMVs more due to high prevalence of malaria in the community

There are public and private primary and secondary schools in the community. Public schools include; Anglican school II Grammar School and Saint Michael Primary school. The private schools include; God's Blessing Group of School (primary and secondary), Holy Infant Jesus Group of schools and Omolewa Nursery and Primary school.

The communityis heterogeneous consisting of people from different part of the country. The Yorubas however constitute the majority. Faith Based Organizations (FBO) and Landlords Associations help in coordinating leadership of the community.

3.3 Study Population

The study population consisted of mothers of under-five children residing in Yemetu community**.**

3.4 Inclusion and Exclusion Criteria

Inclusion criteria

The study involved the following categories of eligible persons:

1. Persons who have under-five children as reported by the mothers/caregivers of the children themselves.
2. Participants who were residents of the study area only
3. Individual who gave informed consent to be involved in the study

Exclusion criteria

The study excluded the following categories of people:

1. Persons who do not have children under the ages of five as reported by the parents themselves.
2. Mothers who were not willing to participate.

3. Individual who were not residents of the study area

3.5 Independent and Dependent Variable

The independent variables in the study include the socio demographic data which include the age, marital status, religion, ethnic group and economic status. The dependent variable on the other hand includes Knowledge, practices and perception of ACT in treating malaria.

3.6 Sample Size

The sample size for this study is estimated from the Leslie Kish (1965) formula for single proportion which is as follows;

$$\mathbf{N= Z^2PQ/ D^2}$$

Where N=Minimum sample size required

Z= Standard normal deviation set at 1.96 normal interval

P= Since the prevalence of the knowledge, practices and perception of malaria and its home management using Artemicinin-basesd Combined among mothers of under-five could not be ascertained through literatures and records, the prevalence is thus put at 50.0% to ensure adequate coverage and proper representation of the respondents in the community under consideration. Thus, P=50.0%

Q= proportion of the people estimated to have been using Artemicinin {Q= (I-P), Q= 1-0.5=0.5}

D= degree of accuracy set at 0.05 (precision set at 5%).

Therefore the sample size N= $((1.96)^2$* 0.5*0.5)/ (0.05*0.05)

N= 3.8416*0.25/0.0025

N=0.9604/0.0025

N=384.16

A non- respondent rate of 10% was added to 384.16= 384.16*10/100=38

Therefore, 38 was added to the sample size calculated 384.16 to make the sample size 422

3.7 Instruments for Data Collection

A semi-structured questionnaire was used for data collection. The semi-structured interviewer and self administered questionnaire was divided into six sections labeled sections A, B, C, D, and E. Section A consisted of questions for documenting the socio-demographic characteristics of the respondents while section B documented general knowledge of signs and symptoms of malaria. Section C contained questions for documenting knowledge of the use of ACTs for treating malaria by mothers of under-five children and section D included practices of mothers of under-five in treating malaria in under-five children using ACTs. Section E, contained questions on perception relating to vulnerability, seriousness and treatment of malaria and perception relating to home management by mothers.

3.8 Validity and Reliability

Validity

According to Davitz and Davits (1997), validity is the extent to which an instrument actually measures what it is expected to measure. To ensure validity, the researcher did an extensive literature search on previous studies on malaria. Literature based information was used to design the instrument for data collection. In addition, the instrument was presented to my supervisor and experts in the fields of pediatricians, psychologists, medical statisticians and health education specialist to check for face and content validity.

Reliability

Reliability is the degree to which an instrument yields constant responses. A measure is said to have a high reliability if it produces consistent result under consistent condition. Fifty questionnaires was pretested among mothers of under-five at Ekotedo community in Ibadan North Local Government Area in Oyo State. After the pre-test, the data gathered was checked for errors and completeness, some questions were removed and some added. Thereafter, unclear and ambiguous words were modified

After that had been done, each questionnaire was numbered for easy recall and a coding guide was prepared to facilitate entry of the data into the system. The data were then subjected to descriptive statistics which was basically frequencies and charts.

Reliability coefficient obtained was determined using the Cronbach's Alpha technique. Any coeficient > 0.5 is said to be reliable. In the study, reliability coefficient score which is also called chronbach Alpha was calculated to be of 0.733.

3.9 Training of Field Assistants.

Four field assistants were recruited and trained for the purpose of data collection. The training focused on several issues including objectives and importance of the study. The instrument for data collection was discussed in details during the three day training period so as to ensure familiarity of the instruments. During this period, the field assistants were made to demonstrate the process of data collection. The field assistants that were trained were involved in the administration of the instrument during pretest. This gave them the opportunity to learn how to collect the required data while the researcher watched the exercise and made necessary corrections.

The research assistants were given four hours training for three days.The training methods used included demonstration and return-demonstration.

3.10 Sampling and Data Collection Procedures

The Expanded Programe on Immunization (EPI) sampling technique was used to facilitate the sampling and interview of the respondents. Theinvestigator started data collection by moving to the center ofYemetu community and spinned a bottle. The spinned bottled was allowed to turn round and round unhindered and allowed to come to rest. Interview started from the part of the community to which the mouth of the bottle was pointing. Every third house in the direction was selected and visited and one eligible respondent was selected by balloting for interview if more than one eligible respondent was met in a house. In a house where there was one mother, such a mother was purposively selected for interview if she consented to participate in the study.

After reaching the end of the community, the investigator and the research assistants moved back to the center of the community and started recruitment and interview in another direction. A total number of 452 household were visited out of which 422 were eligible for interview.

A total of 422 eligible mothers of under-five who consented to be involved in the study were interviewed and 400 instrument were analysed due to incompleteness of some of the research instrument.

3.11 Data Management and Analysis

The copies of the questionnaire were serially numbered for control and recall purpose.

The quality of information collected was checked by the researcher in the field. This entails reviewing the pattern of responses of each participant as recorded in the questionnaire. Problems discovered during data collection was resolved immediately in the field.

Copies of the administered questionnaires were edited and coded by the investigator with the use of coding guide. The data in each questionnaire were entered into a computer for analysis.

The data were analyzed and facilitated by the use ofStatistical Package for the Social Sciences (SPSS) Software version 21after a tempelate had been designed. Copies of the questionnaire have been stored in a place that is safe from destruction and where unauthorized persons would not have access to them. They were destroyed after defense of the project.

Responses to knowledge questions on the causes, symptoms, modes of transmission and methods of preventing malaria and home management of malariawere categorized using a 62-point scale. The knowledge scores of the respondents were computed based on only three categories of responses: *Yes*, *No* and *Don't Know.* Respondents' knowledge scores were categorized as Poor, Fair and Good. Scores of 0-21 points were categorized as "Poor knowledge; those 22-42 points were categorized as "Fair Knowledge", while scores ranging from 43-62 points were categorized as "Good Knowledge".

Likewise, respondents' practices were evaluated as 'Yes and No'as defined. Respondents practice scores were categorized into 'poor' and 'good' practice using a 5-points scale. Respondents who scored <3 were categorized as poor practice, while scores >3 were categorized as good practice The perception scores of the respondents were computed based on only three categories of responses: *Agree, Undecided and Disagree.*A 17–points perception scale was used to assess the respondents' perception on vulnerability, seriousness, treatment and home management of malaria. A perception score ≤9 represents unfavorable perception while a score >9 represents favorable

perception.The quantitative datas were analyzed using descriptive statistics and Chi-square. Chi-square test was used to test for significant associations between variables. A p-value of less than 0.05 was considered as statistically significant.The questions were kept away from the reach of an unauthorized person in computer system where they were locked with a password to ensure confidentiality of information

3.12 Limitation of the study

One major limitation that was encountered during the course of the study was getting the attention of the respondents who were mostly engrossed in their business activities during the days.

Another limitation thatoccurred is that the study participants were expecting incentives which was not given to them; but they were however assured by the researcher that the result of the study would be used in the future to design policy and programmes that would be aimed at controlling malaria in the study area and Nigeria at large.

3.13 Ethical Consideration

All interviews was conducted in compliance with the ethics of the health promotion and education profession. Copies of the research proposal were submitted to Oyo state Ethical Review Committee (ERC) for approval before the study commenced. This was done in order to ensure that the study was conducted in accordance with ethical principle covering studies involving human objects. The research assistants were well trained to obtain informed consent for respondents before interview. Respondent were informed on the purpose of the study and were given option to participate through written or verbal consent or withdraw from participating.Informations provided by the respondent were treated with confidentiality. Registration number was assigned to each questionnaire, no identifiers such as names, address or phone numbers was required on the questionnaire.

CHAPTER FOUR

RESULTS

The findings from this study are provided in this chapter. They are organized into five main sections, namely: Socio-demographic characteristics of the respondents, awareness and general knowledge of malaria, malaria home management practices and perceptions relating to vulnerability, seriousness, treatment and home management of malaria.

4.1 Socio-demographic demographic characteristics of respondents

Table 4.1 presents the socio-demographic characteristics of the respondents. Respondents within the age group 20-29 years constituted the highest (41.8%) followed by those aged 30-39 (40%). Respondents' aged less than 20 years were the least (6.0%). The mean age of the respondents was 29.9 $\pm$7.0 years.

Most of the respondents (90.8%) were married. Respondents with secondary school (56.5%) topped the list of highest level of education. While those with tertiary accounted for (23.8%) of the respondents.

Over half of the respondents were traders (57.8%). While artisans constituted (31.3%). Respondents in monogamousconstituted the majority (71.0%). (See table 4.1 for details)

Table 4.1: Socio-demographic characteristics of the respondents

Socio-demographic characteristics	Frequency	Percent (%)
Age in years: (n=397)*		
Less than 20 years	24	6.0
20-29 years	166	41.8
30-39 years	161	40.6
40-49 years	46	11.6
Marital status: (n=393)		
Single	29	7.3
Married	364	91.0
Religion: (n=400)		
Christianity	207	51.8
Islam	190	47.5
Traditional	3	0.75
Ethnic group: (n=395)		
Yoruba	360	91.1
Igbo	23	5.8
Hausa	12	3.0
Highest level of education: (n=400)		
Primary	79	19.8
Secondary	226	56.5
Tertiary	95	23.8
Type of tertiary education: (n=75)		
University	24	32.0
Polytechnic	39	52.0
Diploma/nursing	12	16.0
Occupation : (n=396)		
Trading	229	57.8
Civil servant	41	10.4
Artisan	124	31.3
Unemployed	2	0.4
Family type: (n=387)		
Polygyny	112	29.0
Monogamous	275	71.0
Children aged less than five: (n=397)		
One	262	66.0
Two	129	32.5
Three	6	1.5

*Mean age: 29.9 $\pm$ 7.0

4.2 Respondents' awareness and knowledge of malaria

The respondents were asked to state the cause of malaria. The responses are highlighted in table 4.2. The listed causes included: Mosquito (98.0%), too much sun (55.8%), overwork (46.3%) and taking too much palm oil (35.3%). Only 23.0% correctly listed plasmodium as the causative agent for malaria. (See table for details).Respondents' knowledge of factors or conditions that can make mosquito breed or multiply are highlighted in table 4.3: Blocked gutters/drains with water (97.0%), empty container or vessels (e.g bottles, cans, plastic etc.) (54.3%), Improper refuse disposal (96.3%), stagnant water (85.0%) empty container or vessels (e.g bottles, cans or plastic) (54.3%) were corrected factors mentioned by the respondents. (See table 4.3 for details). Table 4.4 reveals respondents' knowledge of signs and symptoms of simple malaria. More than half of the respondents erroneously stated that itching is a symptom of malaria. The correct symptom of malaria mentioned included body ache (91.3%), cold (89.3%) and fever (88.5%). The signs/symptoms of severe malaria are shown in table 4.5. The correctly listed signs/symptoms included febrile convulsion (43.8%), organs dysfunction (38.5%) and clinical jaundice (35.0)

Table 4.6 presents respondents' knowledge of preventive measures against malaria. Most of the respondents (91.8%) knew that using Insecticide treated Nets (ITN) is a preventive measure against malaria. The other correctly mentioned preventive measure included; clearing of residential environment of grasses/overgrown weeds (80.5), use of insecticide (73.0%) and use of sulphadoxine pyrimithine by pregnant women (49.8%).(see table 4.6 for detail).

The history of malaria experiences among respondent's under-five children is shown in table 4.7. A high percentage (80.9%) of the respondents revealed that their under-five child(ren) had ever had malaria. (42.5%) respondents stated that their index child had, had malaria. while (24.4%) had disclosed that their index child had malaria within the last 1-3months preceding the study. (See table 4.7 for detail). The categorization of respondents' knowledge scores into poor, fair and good are presented in figure: 4.1. The proportion of respondents with poor knowledge scores constituted 7.1% while those with fair and good knowledge scores were (87.7%) and (5.1%) respectively.

Respondents' knowledge of malaria related to treatment actions involving under-five children with malaria are highlighted in figure 4.8. Correctly mentioned treatment steps or actions included use

of paracetamol (96.2%), tepid spongy (92.2%) and use of coartem (91.0%). The use of chloroquine was correctly listed by (33.1%) as a wrong treatment. (See Table 4.8 for detail).

The knowledge of treatment/dosage regimen for coartem and paracetamol for children aged 0-5 years is summarized in table 4.9. More than half of the respondents (62.2%) were knowledgeable about the correct treatment/dosage of coartem for children ages 6 months – 3 years.About half (50.0%) were conversant with the correct treatment/dosage regimen for coartem for children aged 3-5 years. Majority (64.0%) knew the correct treatment/dosage regimen of paracetamol for children aged 6 months – 3years while only (35.8%) were knowledgeable of the correct treatment/dosage regimen of paracetamol for children aged 3–5 years. (See table 4.9 for details). Figure 4.2 shows respondents' knowledge relating to the appropriate period for initiating treatment when an under-five has malaria. Majority (63.9%) correctly stated that treatment should be initiated immediately an under-five has malaria; 21.1% revealed that treatment should start within 24 hours while very few (6.5%) said treatment should be initiated when signs and symptoms persist.

Respondents' level of awareness relating to any antimalarial suppository which a child is given before taking a child with severe malaria to the hospital is shown in table 4.10. A small proportion of the respondents (4.3%) was aware of such a suppository; among the group, only 47.1% of the respondents could give the name of the drug as rectal artesunate. The categorization of respondents' knowledge scores relating to home management of malaria was assessed using a 19 points knowledge scale, Majority (61.0%) of the respondents had good knowledge of home management of malaria, 32.5.0% had fair knowledge while few (6.5%) of the respondents had poor knowledge. (See Figure: 4.3 for details). Respondents' overall knowledge score was assessed using a 62-points knowledge scale. A larger proportion of the respondents (87.3%) had fair knowledge with a scores ranging from 22-42, only 9.8% of the respondents had good knowledge while 2.9% had poor knowledge scores (See Figure 4.4 for more details). Comparison of respondents' level of knowledge scores by age group is summarized in table 4.11. Majority (87.5%) of the respondents aged less than 20 had fair knowledge, 8.3% had poor knowledge while a smaller portion (4.2%) of the respondents had good knowledge. A larger proportion (83.2%) of respondents' aged 30-39 had a fair knowledge, only (14.3%) had good knowledge while 2.5%) of the respondents had poor knowledge. (See table 11 for detail regarding scores obtained by other

age groups). Comparison of categories of knowledge scores among respondents by marital status is shown in table 4.12. The highest proportion (11.5%) of respondents with good knowledge was recorded among the married respondents; 93.1% of respondents with fair knowledge was among the singles while the highest (3.4%) proportion with poor knowledge was found among the singles. Table 4.13 shows the comparison of categories of knowledge among respondents by level of education. A small proportion (7.6%) of the respondents with primary school education had good knowledge; 87.3% had fair knowledge while 5.1 % had poor knowledge. Few (24.2%) of respondents with tertiary education had good knowledge. (See Table 4.13 for more details).

Table 4.2: Respondents' knowledge of causes of malaria

Causes of malaria^	True (%)	False (%)	Don't know (%)	Total
Mosquito	392(98.0)	8(2.0)	0(0%)	400
Too much sun	221(55.8)	175(44.2)	4(1.0)	396
Change of weather	97(24.3)	281(70.3)	22(5.5)	400
Plasmodium	92(23.0)*	253(63.3)	55(13.8)	400
Taking too much palm oil	141(35.3)	230(57.5)	29(7.3)	400
Overwork/too much work	185(46.3)	199(49.8)	16(4.0)	400
Witchcraft	76(19.0)	292(73.2)	31(7.8)	399

^Non response excluded

*Correct response

Table 4.3: Respondents' knowledge of factors or condition that can make mosquito breed or multiply **N=400**

Factors/conditions	True (%)	False (%)	Don't know (%)
Blocked gutters/drains with water	388(97.0)*	11(2.8)	1(0.3)
Improper refuse disposal	385(96.3)*	15(3.8)	0(0)
Stagnant water	340(85.0)*	58(4.5)	2(0.5)
Empty containers or vessels (e.g. bottles, cans, plastics etc.)	217(54.3)*	162(40.5)	21(5.3)
Engine oil in a container that is not covered+	120(30.0)	250(62.5)	30(7.5)
Stagnant water containing spent engine oil+	122(30.5)	246(61.5)	32(8.0)

*Correct responses

+Incorrect responses

Table 4.4: Respondents' knowledge of signs and symptoms of simple malaria

N=400

Signs and symptoms of simple malaria	Responses		
	Correct (%)	Wrong (%)	Don't know (%)
Inflammation of the skin	169(42.3)	175(43.8)	56(14.0)
Fever	354(88.5)*	38(9.5)	8(2.0)
Nausea+	347(86.8)	45(11.3)	8(2.0)
Diarrhoea+	247(61.8)	136(34.0)	17(4.3)
Vomiting	320(80.0)*	71(17.8)	9(2.3)
Cold	357(89.3)*	36(9.0)	7(1.8)
Tiredness	358(89.5)*	34(8.5)	8(2.0)
Catarrh	365 (91.3)*	34(8.5)	1(.3)
Body ache	365(91.3)*	32(8.0)	3(.8)
Itching +	264(66.0)	125(31.3)	11(2.8)
Fatigue	310(77.5)*	75(18.8)	15(3.8)
Sore throat+	230(57.5)	148(37.0)	22(5.5)

*Correct responses

+Incorrect responses

Table 4.5: Respondents' knowledge of signs and symptoms of severe malaria

Symptoms of severe malaria^	Responses			Total
	Correct (%)	Wrong (%)	Don't know (%)	
Fever	361(90.5)*	25(6.3)	13(3.3)	399(100%)
Chills	352(88.0)*	31(7.8)	17(4.3)	400(100%)
Organs dysfunction	154(38.5)*	126(31.5)	120(30.0)	400(100%)
Abnormal bleeding	104(26.0)	167(41.8)	129(32.3)	400(100%)
Clinical jaundice	140(35.0)*	129(32.3)	131(32.8)	400(100%)
Febrile convulsion	175(43.8)*	107(26.8)	118(29.5)	400(100%)
Respiratory distress	130(32.5)*	119(29.8)	151(37.8)	400(100%)
Impaired consciousness	121(30.3)*	118(29.5)	161(40.3)	400(100%)

^Non response excluded

*Correct response

Table 4.6: Respondents knowledge of preventive measures against malaria

Preventive measures	True (%)	False (%)	Don't know (%)	Total
Using insecticide treated net	367(91.8)*	31(7.8)	2(.5)	400(100%)
Eating balanced diet	218(54.5)+	171(42.8)	9(2.3)	389(100%)
Clearing of residential environment of grasses/overgrown weeds	322(80.5)*	77(19.3)	1(.3)	400(100%)
Clearing blocked gutters	311(77.8)*	87(21.8)	2(.5)	400(100%)
Bathing daily	136(34.0)+	248(62.0)	15(3.8)	400(100%)
Use of insecticide	292(73.0)*	97(24.3)	11(2.8)	400(100%)
Use of antimalarial drug(SP) by pregnant women	199(49.8)*	175(43.8)	26(6.5)	400(100%)
Having enough sleep	87(21.8)+	283(70.8)	30(7.5)	400(100%)
Not eating too much palm oil	98(24.5+	272(68.0)	30(7.5)	400(100%)
Not working in the sun for a long time	90(22.5)+	273(68.3)	37(9.3)	400(100%)

*Correct responses

+Incorrect responses

Table 4.7 History of malaria experiences among respondents' under five children

History of malaria in index child	Yes (%)	No (%)	Total
Children aged less than five ever had malaria	307(80.9)	73(19.2)	380
Index child ever had malaria*	116(42.5)	157(57.5)	273
Index child that had malaria within the last 1-3months	72(24.4)	223(75.6)	295

*Index child refers to respondents under-five children in respect of who some questions were based

N=394

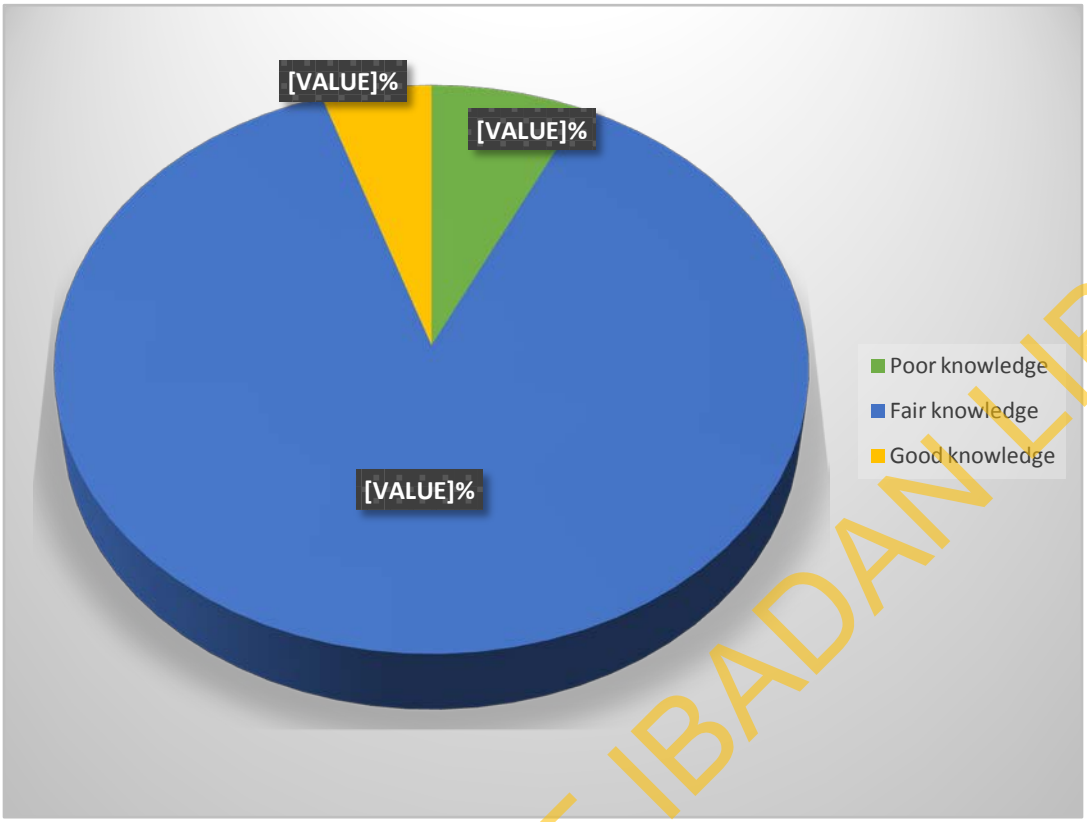

Figure:4.2:Categorization of knowledge scores in points among the respondents.

Key

Poor knowledge= 0-14 points

Fair knowledge= 15-28 points

Good knowledge= 29-43 points

Table 4.8: Respondents' knowledge of malaria related treatment actions involving under-five children treatment

Treatment steps actions^	True (%)	False (%)	Don't know (%)	Total
Tepid sponging	363(92.2)*	25(6.3)	10(2.5)	398
Use of Paracetamol	384(96.2)*	14(3.5)	1(0.3)	399
Use of Coartem	363(91.0)*	22(5.5)	14(3.5)	399
Use of Agbo	267(66.9)	125(31.3)*	7(1.8)	399
Use of Chloroquine	256(64.2)	132(33.1)*	11(2.8)	399
Going to a health care facility for treatment	365(91.5)*	27(6.8)	7(1.8)	399

*Correct responses

+Incorrect responses

^Non-response excluded

Table 4.9: Respondents' knowledge of coartem and paracetamol dosage regimen for children aged 0-5years

Ages(years)	Coartem dosage regimen^	Right	Wrong	Don't know	Total
6months-3years	1 tablet twice daily(3days)*	248(62.2)	93(23.3)	58(14.5)	399
	2 tablet twice daily(3days)	55(13.9)	280(70.7)	61(15.4)	396
	1 tablet thrice daily(3days)	33(8.3)	300(75.8)	63(15.9)	396
3-5years	1 tablet twice daily(3days)	100(25.3)	246(62.1)	50(12.6)	396
	2 tablet twice daily(3days)*	200(50.1)	150(37.6)	49(12.2)	399
	3 tablet thrice daily(3days)	55(13.9)	290(73.2)	51(12.9)	396
	Paracetamol dosage regimen				
6months-3years	1/2 tablet twice daily(3days)*	256(64.0)	93(23.3)	51(12.8)	400
	1 tablet twice daily(3days)	74(18.6)	270(68.0)	53(13.4)	397
	1/2 tablet thrice daily(3days)	38(9.6)	308(77.6)	51(12.8)	397
3-5years	1 tablet twice daily(3days)	190(47.9)	169(42.6)	38(9.6)	397
	1 tablet thrice daily(3days)*	143(35.8)	219(54.8)	38(9.5)	400
	1 tablet once daily(3days)	48(12.1)	306(77.1)	42(10.6)	397

^Non-response excluded *Correct responses

N=399

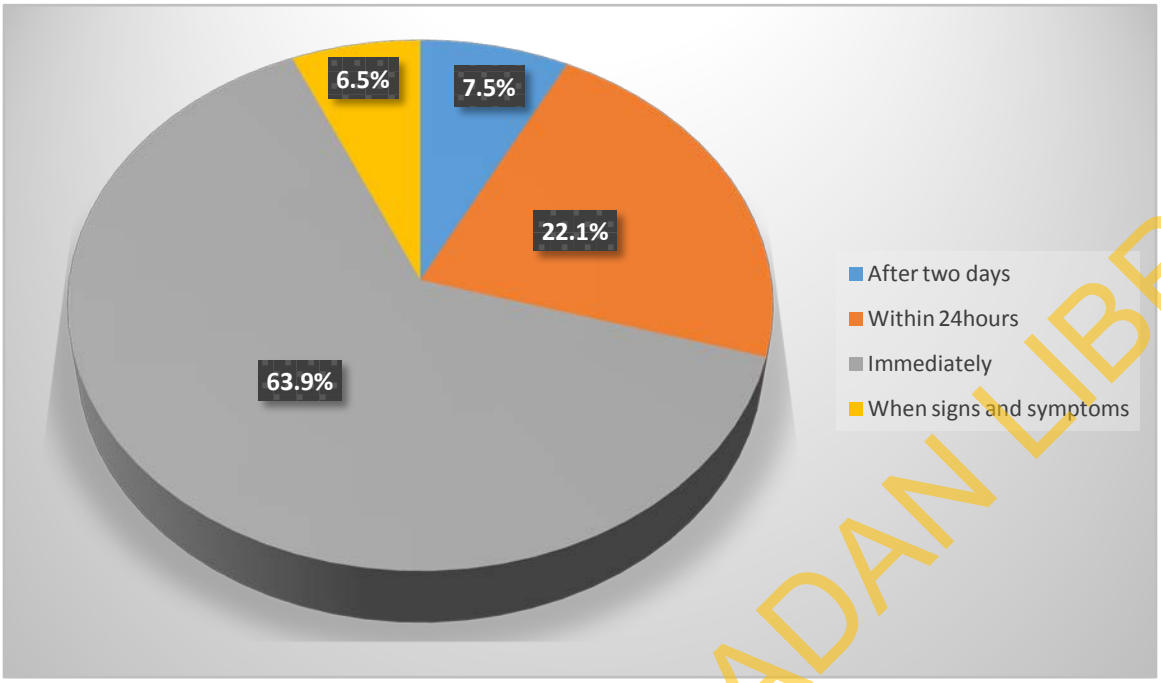

Figure:4.3:Respondent's knowledge relating to the appropriate period for **initiating treatment** when an under-five child has malaria.

Table 4.10: Respondents level of awareness relating to the antimalarial suppository which a child is given before taking him/her to the hospital

Level of awareness	NO	%
Awareness of such suppository (N=399)		
Yes	17	4.3
No	379	95.0
Awareness of name of the suppository (N=17)		
Rectal artesunate	8	47.1
Wrong responses	9	52.9

Table 4.11: Comparison of categories of knowledge scores among respondents by age group

Age group in years	Knowledge categories (%)			Total (%)	X^{2*}	Df	p-value
	Poor	Fair	Good				
<20	2(8.3%)	21(87.5%)	1(4.2%)	24(100.0%)	12.125	6	0.040
20-29	3(1.8%)	152(91.6%)	11(6.6%)	166(100.0%)			
30-39	4(2.5%)	134(83.2%)	23(14.3%)	161(100.0%)			
40-49	2(4.3%)	36(78.3%)	8(17.4%)	46(100.0%)			
Total	11(2.8%)	343(86.4%)	43(10.8%)	397(100.0%)			

Significant at $p<0.05$

*Fisher's exact test was used

Table 4.12: Comparison of categories of knowledge scores among respondents by marital status

Marital status	General knowledge categories (%)			Total (%)	X^{2*}	df	p-value
	Poor	Fair	Good				
Single	1(3.4%)	27(93.1%)	1(3.4%)	29(100.0%)	1.966	2	0.348
Married	9(2.5%)	313(86.0%)	42(11.5%)	364(100.0%)			
Total	10(2.8%)	340(86.5%)	43(10.9%)	393(100%)			

Not significant at p>0.05

*Fisher's exact test was used

Table 4.13: Comparison of categories of knowledge among respondents by level of education

Level of education	General knowledge categories (%)			Total (%)	X^{2*}	Df	p-value
	Poor	Fair	Good				
Primary	4(5.1%)	69(87.3%)	6(7.6%)	79(100.0%)	22.1	4	0.00
Secondary	5(2.2%)	207(91.6%)	14(6.2%)	226(100.0%)			
Tertiary	2(2.1%)	70(73.7%)	23(24.2%)	95(100.0%)			
Total	11(2.8%)	346(86.5%)	43(10.8%)	400(100.0%)			

It is significant at $p<0.05$

*Fisher's exact test was used

N=392

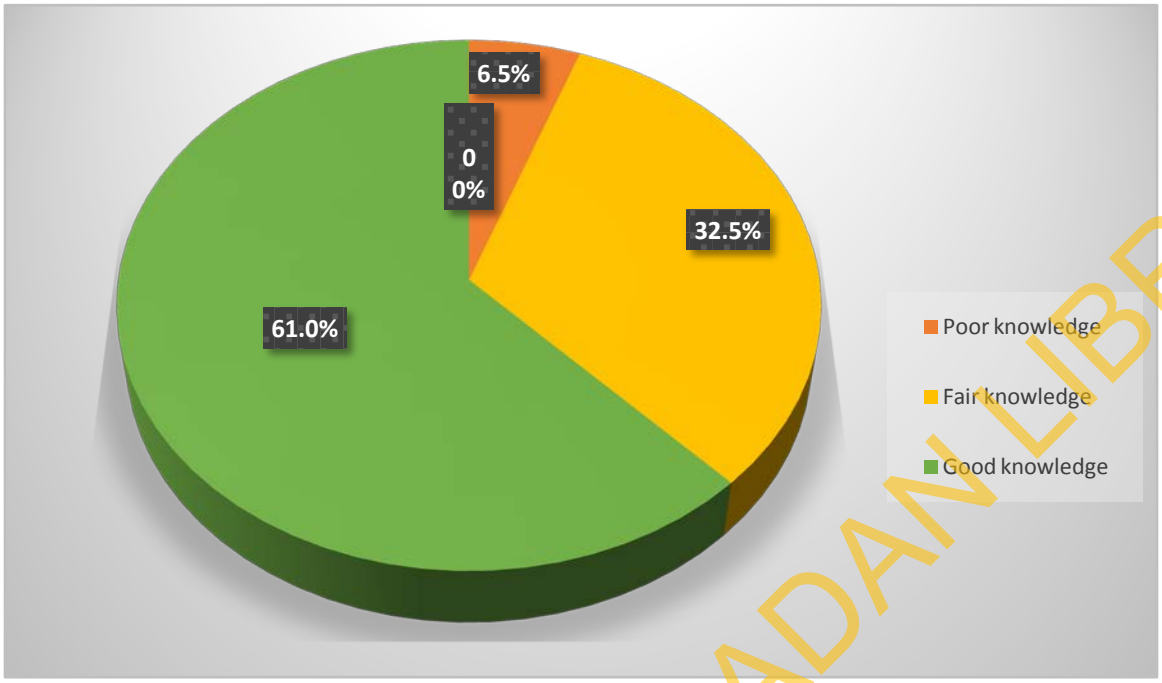

Figure:4.4: Categorization of respondents' knowledge scores relating to home management of malaria

Key

Poor knowledge= 0-6 points

Fair knowledge= 7-12 points

Good knowledge= 13-19 points

N=387

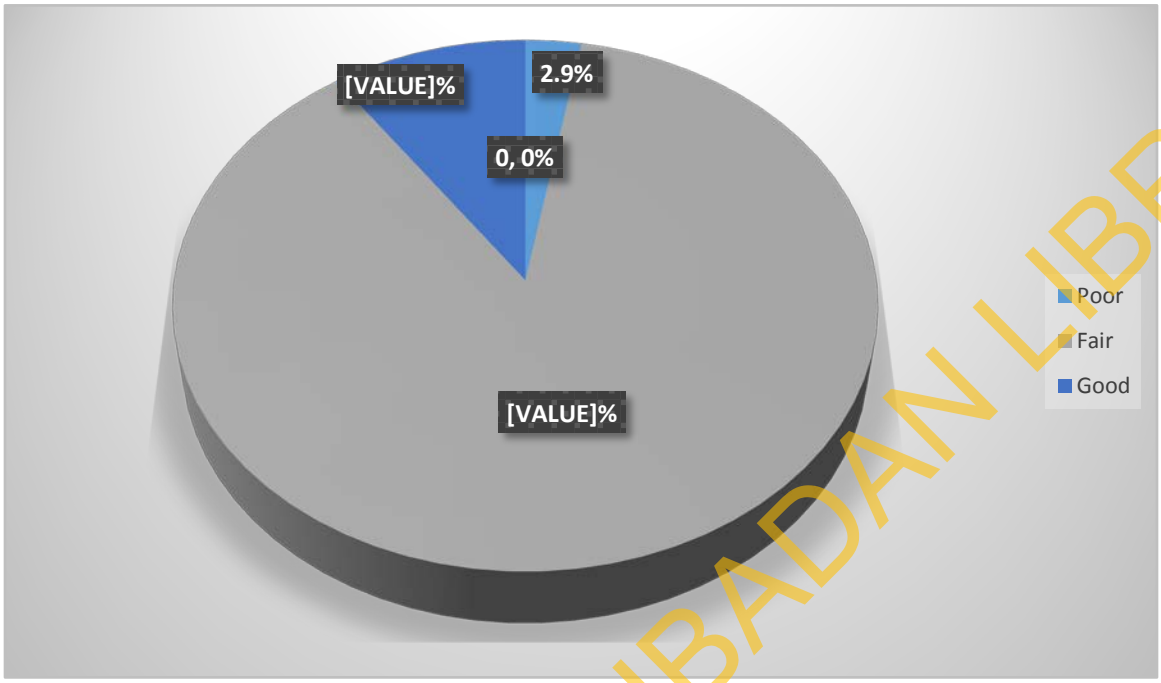

Figure: 4.5: Categorization of respondents' knowledge scores relating to general knowledge of malaria and home management of malaria.

Key

Poor knowledge= 0-21 points

Fair knowledge= 22-42 points

Good knowledge= 43-62 points

4.3Respondents' practices related to home management of malaria

Respondents pattern of use and storage of antimalarial drugs and related medicine for treating under-fives is highlighted in Table 4.14. Majority (89.7%) of the respondents had used an antimalarial drug to treat their under-five child (ren) while only 10.3% had never used antimalarial drugs. The antimalarial drug normally used included; coartem (34.2%), artesunate (29.0%), amalar (24.3%), while (10.5%) listed fansidar. Respondents were further asked about type of malarial medicine used. Respondents that used coartem (67.2%) topped the list. Respondents that used paracetamol for pain relieve in treating under-five at home had the highest proportion of (80.7%) A majority (72.1%) kept their related malaria medicine in a cool dry places. (See Table 4.14 for details).

Table 4.15 highlighted malaria treatment seeking pathways for under-five during episodes of malaria preceding the study. The highest proportion (39.1%) sought for treatment in a hospital, followed by Patent Medicine Vendors (PMVs) (30.1%). The other listed places are contained in the table under reference. Respondents' step by step home management of malaria involving under-five children is specified in table 4.16. The fairly correct steps mentioned were as follows: Exposure of baby to fresh air, administration of paracetamol, and then provision of coartem(2.6%) and bathing the baby, use of paracetamol and administration of coartem(1.3%) (See Table 4.16 for detail). Categorization of overall respondents' practice score was assessed using a 5-point scale. Respondents with good practice (4-5points) constituted 94.0%, while the proportion of respondents with poor practice (0-3) accounted for 6.0%.

Table 4.14: Pattern of use and storage of antimalarial drugs and related medicine for treating under-fives

Pattern of use of antimalarial	No	%
Ever used an antimalarial to treat under-five (N-398)		
Yes	357	89.7
No	41	10.3
Types of malarial medicine used(N=399)		
Coartem *	268	67.2
Artesunate*	65	16.3
Chloroquine -	28	7.0
Paracetamol -	18	4.5
Ampiclox -	13	3.3
Alabukun-	7	1.8
Pain relieving medicine normally used for treating underfive at home in case of malaria(N=399)		
Paracetamol*	322	80.7
Novagen-	47	11.8
Ibuprofen -	22	5.5
Alabukun -	8	2.0
Places where antimalarial medicines are kept at home(N=399)		
Cool dry place*	287	72.1
Inside nylon +	60	15.1
Inside wardrobe+	32	8.0
In the kitchen -	19	4.8

*Appropriate practice

+Considerably fair practice

-Inappropriate practice

Table 4.15: Malaria treatment seeking pathways for under-five during episodes of malaria preceding study. **N=399**

Where sought treatment	No	%
Hospital*	156	39.1
Patent Medicine Vendors (PMV) ±	120	30.1
Health centre*	50	12.5
Private clinic*	37	9.3
Primary Health Care (PHC)*	30	7.5
Community Medicine Distributors (CMDs)+	6	1.5

*Appropriate practice

+Good practice to some extent

±Unreliable practice

Table 4.16: Respondents step by step home management of malaria involving under-five child

N=379

Steps taking at home	**No**	**%**
Use paracetamol for the baby+	177	46.7
Bath the baby±	52	13.7
Bath the baby and use PCM for the baby+	55	14.5
Use agbo for the baby±	44	11.6
Mop the body with cloth soaked in cold water±	11	2.9
Bath the baby, use paracetamol for him/her and take him/her to the hospital*	25	6.6
Expose to fresh air, give paracetamol and give coartem*	10	2.6
Bath for the baby, use paracetamol and give the baby coartem*	5	1.3

***Fairly appropriate practice**

+Beneficial practicebut not scientific

±Unreliable practice

4.4 Respondents' perception relating to vulnerability, seriousness and treatment.

Table 4.17 summarizes respondents' perception relating to vulnerability, seriousness and treatment of malaria. A small proportion of the respondents (2.8%) were of the perception prone that their children is not prone to malaria and so there is no need for them to take preventive measures. A high proportion of the respondents (84.5%) did not consent to the opinion that a child that is well fed cannot have malaria. Majority (84.3%) did not believe malaria is a disease of the poor. Respondents were further asked about their perception relating to seriousness of malaria. Most (96.0%) of the respondents were not in support of the notion that malaria is a not a serious disease for children. Most (96.0%) were of the perception that malaria can lead to death of children aged less than five years. A higher proportion (94.3%) did not believe malaria infection will disappear on its own without treatment. (See Table 4.17 for details).

The perceptions of the respondents relating to home management of malaria are contained in Table 4.18. 5.0%were of the perception that chloroquine alone is enough to treat children of any kind of malaria. Majority (76.5%) were not in support of the notion that malaria in a child at home is better treated with chloroquine than Artemisinin Combination Therapy (ACTs). A small prportion (19.8%) prefers herbal medicine to medical medicine for treating their child at home when they have malaria because it is cheaper for treating under-five with malaria. General perception score of the respondents was obtained using a 17-point scale. Majority of the respondents (89.8%) had favorable perception (i.e. scored between 10-17) while minority (10.3%) had unfavorable perception with a range of 0-9 points. Perceptions in line with scientific view are marked with the + sign while perception not in line with scientific view are marked with the $\pm$ sign. (See Table 4.18 for details).

Table 4.17: Respondents perception relating to vulnerability to seriousness and of treatment of malaria **N=400**

Perception	Agree	Undecided	Disagree
Perception relating to vulnerability			
My child is not prone to malarial so no need of taking preventive measures	11(2.8)±	4(1.0)	385(96.3)+
I believe malaria is a disease of the poor, our child cannot get it because we are not poor	60(15.0) ±	3(0.8)	337(84.3)+
I make sure my child stays away from people or other children having malaria to avoid getting it.	55(13.8) ±	9(2.3)	336(84.0)+
I am of the opinion that a child that is well fed cannot have Malaria	50(12.5) ±	12(3.0)	338(84.5)+
Perception relating to seriousness			
I do not believe malaria is a serious disease for children	12(3.0) ±	4(1.0)	384(96.0)+
Malaria cannot lead to death of children aged less than five years	7(1.8) ±	9(2.3)	384(96.0)+
Perception relating to treatment			
Malaria infection is caused by witches and wizards, so telling me about using drugs to treat it is a waste of time	6(1.5) ±	28(7.0)	366(91.5)+
I believed malaria infection will disappear on its own without treatment/medicine	11(2.8) ±	12(3.0)	377(94.3)+

±Perceptions in line with scientific view

+Perception not line with scientific view

Table 4.18: Respondents' perception relating to home management of malaria

N=400

Perception	Agree	Undecided	Disagree
I believe chloroquine alone is enough to treat my child of any kind of malaria at home	20(5.0) ±	52(13.0)	328(82.0)+
I am of the opinion that coartem should be used at home only when the child's malaria is serious	27(6.8) ±	68(17.0)	305(76.3)+
Malaria infection in a child is best treated at home with chloroquine than Arthemicinin-based Combined Therapy (e.g coartem, artesunate etc)	24(6.0) ±	70(17.5)	306(76.5) +
The first dosage of malaria drug is enough to treat children when they have malaria	9(2.3) ±	47(11.8)	344(86.0) +
Iprefer herbal medicine to medical medicine for treating my child at home when he/she has malaria because it is cheaper for treating under-five with malaria	79(19.8) ±	68(17.0)	253(63.3) +
Traditional medicine used at home is more effective for treating malaria in children aged less than five years	82(20.5) ±	67(16.8)	251(62.8) +
It is better to wait for a day or two to see whether an under-five has malaria before treating him/her at home with malaria medicine	105(26.3) ±	24(6.0)	271(67.8) +
Every mother should keep medicine at home for the home management of malaria when the need arises	301(75.3)±	9(2.3)	90(22.5) +
It is wrong for a mother to treat her under-five children at home in case of malaria	133(33.3) ±	8(2.0)	259(64.8)_

±Perception in line with scientific view

+Perception not line with scientific view

Key:

Unfavorable perception= (0-9)

Favorableperception= (10-17)

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

This chapter focusses on the discussion of the findings of this study. It starts with the discussion of the socio-demographic characteristics of the respondents, followed by awareness and general knowledge of malaria, malaria home management practice and perception relating to malaria infection. The implications of the findings for health education are also discussed in this study. Thus, the chapter end with evidence based recommendation.

5.1.1 Socio-demographic characteristics

The ages of the respondents ranged from 16-48years and the mean age was 29.9 $\pm$ 7.0. Majority of the respondents were within the range 20-29. A similar result was obtained by Adeyemo, Oluwatosin, Amodu, and Taofeek (2014): Ebuehi and Adebajo (2010).

A very high proportion (92.6%) of the respondents were married while few of them were single mothers (7.4%). Majority of the respondents belonged to the Yoruba ethnic group. This could be traced to the fact that the study location is situated in the south-westhern part of the country where the Yoruba's are the predominant ethnic group, as shown.

5.1.2 Awareness and general knowledge of malaria.

The findings of this study showed that majority of the respondents hadpoor knowledge of the major cause of malaria (plasmodium), though they were able to attribute the cause of malaria to mosquito. A similar study was carried out by Jombo, Mbaawuaga et al (2010) where respondents were aware of the existence of malaria and were able to associate it with mosquito but demonstrated poor knowledge on plasmodium as a cause of malaria. Also, the study worked in concomitant with a study conducted by Ashikeni, Envuladu (2013) where mothers of children less than five years demonstrated poor knowledge of the cause of malaria at baseline.

It was observed in this study that there was a high level of knowledge of the signs and symptoms of malaria by a larger proportion of the respondents.This is very encouraging as it would

significantly influence respondence ability to take early and appropriate action to treat malaria at the onset of any of its signs and symptoms without delay.

Respondent knowledge of preventive measures against malaria in this study was fair. Majority (54.5%) attributed preventive measure of malaria to eating of balanced diet while only (42.8%) disagreed not to do so. This corroborate a study conducted by Adebayo, Akinyemi, and Cadmus, (2015) concluded that the knowledge of malaria prevention is still low among under-five caregivers and pregnant women in Southern Nigeria. Despite the current control measures put in place. Hence there is need for concerted health education intervention to improve the knowledge of rural dwellers regarding malaria prevention and control.

Respondents' knowledge of ACT dosage regimen in this study was fair as this could be traced to their level of education. Respondents with tertiary level of education were found to be more knowledgeable on the dosage regimen. On the other hand, respondents with primary and secondary level of education were less knowleageable. This result is in agreement with a study carried out by Ajayi et all (2013). Where they deduced that few respondents practice home management of malaria correctly while many of them end in hospital due to lack of ideal dosage of antimalarial drug.

5.1.3 Malaria home management practice

This study showed that respondents had a good practice of home management of malaria in terms of pattern of use of antimalarial drugs and where they sought treatment. Majority of the respondents used the recommended malarial drug(ACT) to treat their under-five children. In a related study carried out by Ashikeni et al (2013),it was observed that the respondents were not using the drug (ACTs) recommended by the Federal government of Nigeria for the treatment of malaria. Chloroquine which had been reported to have growing resistance in most parts of the country was still in use by majority of the women. This result showed that adequate and proper health education should be given to women. Health education to respondents especially in the language they understood, increased their knowledge and improved their practice of the treatment of malaria in children.

5.1.4 Perception relating to malaria

Respondents in this study had good perception of home managaemet of malaria. Majority of the respondent believed that ACT is best used in treating under-five children at home when they have malaria. A similar study was carried out by Ajayi, and Falade(2006); Salako, Brieger, Afolabi (2001) where respondents use chloroquine, and sulphadoxime/pyrimethamine (SP) at home for the treatment of malaria.

5.1.5 Implication of findings for health education

Findings from this study have health promotion and education implications and thereby the need for planning and implementation of multiple health strategies that will help to tackle the inherent problems in this findings.

Public enlightenment: Public enlightenment is a useful health education strategy. The strategy has been widely used to disseminate information successfully through the use of several media (both print and electronic media) aimed at raising people's awareness and knowledge relating to malaria. Hence, there is need to enlighten the public on the importance of practicing preventive measures at home and community levels. Intervention relating to malaria should be put in place for the people. Education and communication materials like posters, handbills, jingles through media among others should be made available for under-five mothers.

Health education: Public health education campaign for mothers and health care givers to create awareness that may lead to reduction of vectors of malaria infection and control of the disease especially in young children andempowering mothers and other caregivers need to treat malaria infection at home. Emphasizing appropriate steps to take at home when an under-five have malaria is important. Also, making the signs and symptoms of malaria as essential component of home management of malaria, dispelling all misconception about signs and symptoms of malaria. A peer education approach could also be used at the community level to upgrade mothers' knowledge and skills concerning the treatment, prevention and control of malaria.

Advocacy: Advocacy is a health education strategy that can be used to motivate and involve the following target group in malaria infection prevention and control effort: policy makers, traditional and religious leaders, the media, and the community. Therefore, more advocacy work needs to be

done especially at the community levels and through formulation of relevant policies that will empower under-five mothers and caregivers.

5.2 Conclusion

This study revealed that the level of awareness and knowledge of malaria among respondents was fair. However, there are several gaps in the respondents' knowledge relating to the disease and its management in under-five. The respondents had a poor knowledge of the causes of malaria and fair knowledge of the factors that could promote breeding of malaria. Advocacy, training and public enlightenment are necessary to address the situation.

The knowledge of the respondents about malaria varied with age. It was observed that, respondents aged ranged 30-39 years were more knowledgeable about malaria than respondents aged less than 20years and respondents aged 40 and above. Also, the respondents' knowledge varied with their level of education as it was recorded that the respondents with tertiary level of education were more knowledgeable than respondents of primary and secondary level of education. This is expected as the respondents of tertiary level of education were more exposed to more educational opportunities than their less educational counterparts. The respondents' awareness of ACT as recommended mode of managing malaria was high but their knowledge of dosage regimen was fair.

The study showed that majority of the respondents had good home management practice of malaria. A major appropriate practice shown by the respondents was in their use of coartem as malaria medicine in treating their underfive child(ren) when they have malaria. Respondents had appropriate practice in keeping their malaria drugs and other related medicines in a dry cool place after purchase. On the other hand, they showed poor practice in steps taken at home when their children had malaria.

There were positive and negative perceptions about malaria among the respondents. A major negative perception is respondents' refusal to take preventive measures because they believe their child(ren) are not prone to malaria infection. Other negative perception which can compromise the prevention and control of malaria infection is that malaria is not a serious disease for children and that malaria cannot lead to the death of children aged less than five. The positive perceptions included their treatment believe that malaria infection will not disappear on its own without treatment and that malaria is not caused by witches or wizards.

5.3 Recommendations

The recommendations based on the findings of this study are as follow:

1. Sustained public enlightenment interventions relating to malaria targeted at mothers of under-five are needed. These intervention should be aimed at improving their knowledge and their malaria prevention and control skills.

2. Artemisinin Combination Therapy (ACT) is the new strategy for managing malaria. Training is needed to improve their knowledge and skill relating to the approach.

3. Formal health care facilities are commonly used by the residents for the management of malaria in under-five. The capacity of health workers should be enhanced to help upgrade mothers' knowledge and skills relating to correct treatment regimen for managing malaria.

4. Training on home management of malaria should be organized for respondent. A peer education approach should be used in this regard to upgrade mothers' knowledge and skills concerning the treatment, prevention and control of malaria.

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APPENDIX I

QUESTIONNAIRE

Knowledge, practices and perception of malaria and its home management using Artemicinin-based Combine Therapy (ACTs) among mothers of under-five in Yemetu community of Ibadan North Local Government.

INTRODUCTION AND INFORMED CONSENT.

Dear Respondents,

I am a postgraduate student of the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan. The purpose of this study is to investigate the **knowledge, practices and perception of malaria and its home management using Artemicinin-based Combined Therapy (ACTs)among mothers of under-five.** The findings from this study will help in the design of programs and formulation of policies that is aimed at bridging the knowledge and practice gap of under-five mothers/caregivers in treatment of malaria among under-five children to reduce their mortality and morbidity rate and improve their health. Your identity, responses and opinion will be kept strictly confidential and will be used for the purpose of this study only. Please note that, you do not have to write your name on this questionnaire, also try to please give honest answers to the questions asked as much as possible as your maximum co-operation will assist in making this research a success.

SECTION A: Socio-Demographic Characteristics

Instructions: In this sections please tick (√) the blank boxes ☐ in the appropriate boxes that correspond to your answers or complete the blank spaces provided

a. Personal Demographic Information.

1. Age as at last birthday (in years) _____
2. Marital status 1.Single ☐ 2.Married ☐ 3.Divorced ☐ 4.Separated ☐ 5.Co-habiting ☐
3. Religion 1.Christianity 2.Islam 3.Traditional 4.Others(specify)_____
4. Ethnic group 1.Yoruba ☐ 2.Igbo ☐ 3.Hausa ☐ 4.Others(specify)_____

5a. Highest level of education 1.Primary ☐ 2.Secondary ☐ 3.Tertiary ☐

4. Others specify_____

5b. If tertiary, please specify _____

6a. What is your occupation? 1. Trading ☐ 2.Civil servant ☐ 3.Artisan ☐

4.Others (specify)_____

Note: If not civil servant go to Q7

6b. If civil servant, what is your main occupation by training in the civil service (e.g Lawyer,Teacher etc.)_____

7. Family type 1. Polygyny (one man with two or more wives) ☐ 2.Monogamous (one man with one wife) ☐ 3. Others (specify)_____

8. How many children aged less than five years has God blessed you with as at today? _____

SECTION B:Awareness and general knowledge of Malaria

9.0 Table 1 contains a list of factors, (animals or conditions etc.) For each, kindly tick(√) '*True*' if it is the main **cause of malaria** or '*False*' if it is not the main cause of malaria; if you are not sure please tick(√) '*Do not know*'

Table 1

S/N	Causes of malaria	Tick(√) one for each statement		
		True	False	Do not know
9.1	Mosquito			
9.2	Too much sun			
9.3	Change in weather			
9.4	Plasmodium			
9.5	Taking too much palm oil			
9.6	Overwork /too much work			
9.7	Witchcraft			

10.0 Table 2contains a list of statements relating to factors that can makemosquito breed and multiply. For each kindly tick (√) '*True*' if it can make mosquito breed or multiply; or tick (√) '*False*' if cannot make mosquito breed or multiply; If you are not sure please tick '*Donotknow*'

Table 2

S/N	Factors or conditions that can make mosquito to breed or multiply	Tick(√) one for each statement		
		True	False	Do not know
10.1	Blocked gutters/drains with water			
10.2	Improper refuse disposal			
10.3	Stagnant water			
10.4	Empty containers or vessels (e.g. bottles, cans, plastic etc.)			
10.5	Engine oil in a container that is not covered			
10.6.	Stagnant water containing spent engine oil			

11.0 Table 3 contains some symptoms of **simple malaria** in under-fives. For each please tick (√) '***Correct***' if it is a **major symptom** of simple malaria or tick(√) **'*Wrong*'** if it is not. If you are not sure please tick (√) **'Do *not know*'**

Table 3

S/N	Signs and symptoms of simple malaria	Tick (√) one for each statement		
		Correct	Wrong	Do not know
11.1	Inflammation of the skin(redness and swelling)			
11.2	Fever (hotness of body)			
11.3	Nausea (feeling sick and irritated)			
11.4	Diarrhoea			
11.5	Vomiting			
11.6	Cold/chills			
11.7	Tiredness			
11.8	Catarrh			
11.9	Body ache			
11.10	Itching			
11.11	Fatigue			
11.12	Sore throat			

12.0 Table 4 contains some signs and symptoms of **severe/complicated** malaria in under-fives; For each kindly tick (√) **'*correct*'** if it is a symptom of complicated malaria or tick (√) **'*wrong*'** if it is not. If you are not sure please tick **'*Do not know***

Table 4

S/N	Signs and symptoms of severe/ complicated malaria	Please tick(√) one for each symptoms		
		Correct	Wrong	Do not know
12.1	Fever (hotness of the body)			
12.2	Chills (feeling cold)			
12.3	Organs dysfunction			
12.4	Abnormal bleeding			
12.5	Clinical jaundice			
12.6	Febrile convulsion			
12.7	Respiratory distress			
12.8	Impaired consciousness			

13.0 Table 5 contains some preventive measures; For each kindly tick (√) ***'True'*** if it is a measure for preventing malaria or ***'False'*** if it is not a measure for preventing malaria in under-fives; if you are not sure please tick '***Do not know***'

Table 5

S/N	Preventing measures	Please tick (√) one for each measure		
		True	False	Do not know
13.1	Using insecticide Treated Net (ITN)			
13.2	Eating balanced diet			
13.3	Clearing of residential environment of grasses/overgrown weeds			
13.4	Clearing blocked gutters/drains			
13.5	Bathing child daily			
13.6	Use of insecticide sprays			
13.7	Use of antimalarial drugs (SP) by pregnant women			
13.8	Having enough sleep			
13.9	Not eating too much palm oil			
13.10	Not working in the sun for a long time			

14.a Has any of your children aged less than five ever had malaria? 1. Yes ☐ 2. No ☐

Note: Select an index child for question 14b and 14c

14.b Has ……(**Index child**) ever had malaria?1.Yes ☐ 2. No ☐

14.c Did……...(**Index child**) had malaria within the last 1-3months? 1. Yes ☐ 2.No ☐

SECTION C:Knowledge of home management of malaria

15.0 Table 6 contains steps which should be taken at home when a child has malaria. For each step, please kindly tick (√) ***'True'*** if it is a **right** step or tick (√)***'False'*** if it is a **wrong** step; if you are not sure please tick ***'Do not know'***

Table 6

S/N	Treatment steps	Please tick (√) one for each statement		
		True	False	Do not know
15.1	Tepid sponging			
15.2	Use of paracetamol			
15.3	Use of coartem			
15.4	Use of agbo			
15.5	Use of chloroquine			
15.6	Going to a health care facility for treatment			

16. Haveyou ever heard of coartem or Arthemeter Lumenfantrine(AL)? 1. Yes ☐ 2.No ☐

17.0 Table 7 contains dosage regimen for Artemrther Lumenfantrine (AL) or coartem for different ages. Kindly tick **(√) 'Right'** if the dosage is correct or tick (√)**'Wrong'** if the dosage is incorrect; If you are not sure please tick **'Do not know'**

Table 7

S/N	Ages in months	Coartem dosage regimen	Please tick(√) one for each dosage		
			Right	Wrong	Do not know
17.1	6months-3years	I tablet twice daily for 3days			
17.2		2 tablet twice daily for 3days			
17.3		1 tablet thrice daily for 3days			
17.4	3years-5years	1 tablet twice daily for 3days			
17.5		2 tablet twice daily for 3days			
17.6		3 tablet thrice daily for 3days			

18.0 Table **8** contains dosage regimen for paracetamol for different ages. Kindly tick **(**√) **'Right'** if the dosage is correct or tick (√)**'Wrong'** if the dosage is incorrect; If you are not sure please tick **'Do not know'**

Table 8

S/N	Ages in months	Paracetamol dosage regimen	Please tick(√) one for each dosage		
			Right	Wrong	Do not know
18.1	6month0s-3years	Half tab thrice daily for 3days			
18.2		1tab thrice daily for 3days			
18.3		Half tab once daily for 3days			
18.4	3years-5years	1tab twice daily for 3days			
18.5		1tab thrice daily for 3days			
18.6		1tab once daily for 3days			

19. When is the **appropriate** time to commence treatment when an under-five child is having malaria? 1. After two days ☐ 2. Within 24hours ☐ 3. Immediately ☐ 4.When signs and symptoms persist ☐ 5. Others (specify) _____

20. (a) Have you ever heard about an antimalarial drug which a mother can insert in the anus of his/her child who has severe malaria before taking him/her to the hospital? 1. Yes ☐ 2. No ☐

20. (b) If yes to question **20a**, what is the name of the drug or medicine?_____

SECTION D: Practices relating to malaria treatment

21a. Have you ever used an antimalarial drug/medicine to treat your under-five child at home? 1. Yes ☐ 2. No ☐

If yes to question **21a,** answer question **21b**. Ifno to question **21a** move to question **22**

21b. If yes, what antimalarial medicine do you normally use? _____

22. Which of the following medicines have you used to treat your under-five when he or she has malaria? 1. Coartem ☐ 2. Ampiclox ☐ 3. Artesunate ☐4. Chloroquine ☐ 5. Paracetamol ☐ 6. Alabukun ☐ Others (specify) _____

23. Which pain relieving medicine do you use for treating your under-five child at home in case of malaria? 1. Paracetamol ☐ 2. Novagen ☐ 3. Ibuprofen ☐ 4. Alabukun ☐ 5. Others (specify) _____

24. Where did you seek treatment for your child when he/she had her last episode of malaria? 1. Patent Medicine Vendors (PMVs) ☐2. Community Medicine Distributors (CMDs) ☐3.Primary Health Care ☐ 4. Health center ☐ 5. Hospital ☐ 6. Private clinic ☐ 7. Faith Based Organization (FBO)8. ☐raditional Birth Attendants ☐ 9. Others (specify)_____

25. Where do you keep your drugs for treating your under-five children in case of malaria? 1. Cool dry place ☐ 2. Inside nylon ☐ 3. Inside wardrobe ☐ 4. In the kitchen ☐5. Others (specify)_____

26. Please describe what you usually do at home step by step to care for any of your children aged less than five years who has malaria_____

SECTION E: Perception relating to vulnerability, seriousness and treatment

27.0 Table 9 contains a list of perception; For each, kindly tick (√) whether you **agree** with it, **disagree** with it or whether you are **undecided/not sure**

Table 9

S/N	Statements	Please tick(√)one for each statement		
		Agree	**Undecided**	**Disagree**
27.1	My child is not prone to malaria; so no need of taking preventive measures			
27.2	I believe malaria is a disease of the poor, our child cannot get it because we are not poor			
27.3	I do not believe malaria is a serious disease for children			
27.4	Malaria infection is caused by witches and wizard, so telling me about using drugs to treat it is a waste of time			
27.5	Malaria cannot lead to the death of children aged less than five years			
27.6	I believed malaria infection will disappear on its own without treatment/medicine			
27.7	I make sure my child stays away from people or other children having malaria to avoid getting it			
27.8	I am of the opinion that a child that is well fed cannot have malaria			

28.0 Table 10 contains perception relating to home management; For each, kindly tick (√) whether you **agree** with it, **disagree** with it or whether you are **undecided/not sure**

Table 10

S/N	Statements	Please tick(√)one for each statement		
		Agree	**Undecided /Not sure**	**Disagree**
28.1	I believe chloroquine alone is enough to treat my child of any kind of malaria at home			
28.2	I am of the opinion that coartem should be used at home only when the child's malaria is serious			
28.3	Malaria infection in a child is best treated at home with chloroquine than Artemicinin-based Combine Therapy (eg coartem, artesunate etc)			
28.4	The first dosage of malaria drug is enough to treat children when they have malaria			
28.5	I prefer herbal medicine to medical medicine for treating my child at home when he/she has malaria because it is cheaper for treating			

	under-fives with malaria			
28.6	Traditional medicine used at home is more effective for treating malaria in children aged less than five years			
28.7	It is better to wait for a day or two to see whether an under-five has malaria before treating him/her at home with malaria medicine			
28.8	Every mother should keep medicines at home for the home management of malaria when the need arises			
28.9	It is wrong for a mother to treat her under-five children at home in case of malaria			

APPENDIX II

A: Consent Form for survey Respondents

Name of the Investigator: AKINWALERE, Bunmi Ejiro.

Name of organization: University of Ibadan

Name of Sponsor: Husband

Title of Project: Knowledge, practices and perception of malaria and its home management using Artemicinin Combination Therapy (ACT) among mothers of under-five in Yemetu community of Ibadan North Local Government area, Ibadan

Greetings: My name is AKINWALERE, Bunmi Ejiro. I am a student of the Department of Health Promotion and Education, College of Medicine, University of Ibadan. I am involved in a study to document the knowledge, practices and perception of mothers of under-five in Yemetu community. Your honest answers to the questions contained in the questionnaire will be useful in planning for appropriate ways in controlling and / or preventing malaria in your local government area.

Purpose of the Research: We are planning to carry out a study to document under-five mothers' knowledge, practices and perception relating to the control of malaria infection in your community. We would therefore like to find out your views, opinions, perceptions and practices related to malaria infection. Your honest answer to the question we will ask you will be useful for policy formulation concerning the control of malaria infection in your LGA and in Oyo state at large.

Procedures: To find answers to some of these questions, we invite you to take part in this research project. If you accept, you will be asked to answer some question. A lot of the questions will relate to your experience, knowledge, practices and perceptions related to prevention of malaria.You will be asked some questions one by one and your response will be recorded on a questionnaire.

Risks and Discomfort: There is a slight risk as you may feel uncomfortable talking about some issues. However, we do not wish this to happen, and you may refuse to answer any of the questions

or not take part in a portion of the survey if you feel the question(s) make you uncomfortable. Participation in the survey will take about 20 minutes of your time.

Benefits: There will be no direct benefit to you as a person but the information obtained from this study will be used for designing appropriate intervention programmes for the control and prevention of malaria.

Incentives: You will not be provided any monetary incentives or special tangible rewards for participating in the study. However, we will register our gratitude to you for participating.

Confidentiality: We have taken the following steps to ensure that you are safe and that the information you provide us is confidential. The interview will take place in a private place, where no one else will here what you discuss with the interviewer. The information that we collect from this research project will be kept confidential. Information collected from you will be stored in a file that will not bear your name. Any other identifier or mark which is capable of revealing your identity will also not be put on your questionnaire so, no one can trace your responses to you.

Opportunity to refuse and/ or withdraw: You do not have to take part in this research if you do not want to, and refusing to participate will not affect you. You may stop participating in the interview at any time that you wish, and there will be no negative consequence for you in any way. Your participation is purely voluntary.

Who to contact: If you have any question you may ask now or later. If you wish to ask questions later, you may contact any of the following:

(1) AKINWALERE, Bunmi Ejiro

Department of Health Promotion and Education,

College of Medicine, University of Ibadan.

Telephone no: 07035250175

Email: akinwalereb@yahoo.com

(2) Dr F.O. Oshiname (Supervisor)

Head of Department,

Department of Health Promotion and Education,

College of Medicine, University of Ibadan.

Telephone: 08035001060

Email: foshiname@yahoo.com

Certification of Consent for Qualitative study: I have been invited to take part in the research on knowledge, practices and perceptions of malaria and its home management using ACT among mothers of underfive. I have read the foregoing information and I have had the opportunity to ask question about the research and all my questions have been answered to my satisfaction. I therefore consent volountarily to be a participant in this study and understand that I have the right to withdraw from the interview at any time I so wish.

APPENDIX III

IWE IBEERE

IMO, ISESI ATI ERO OKAN AWON IYA AWON OMO OOJO TI TI DE ODUN MARUN NIPA LILO OOGUN IBA TI IJOBA FI OUNTE LU (Arthemicinin-based Combination Therapy) NI YEMETU, IJOBA IBILE IBADAN NORTH, IBADAN.

IFIRA ENI HAN ATI ITORO AYE

ldahun Ibeere,

Mo kin yin, mo je akeeko agba ni ile eko gbogbonise ti ilu Ibadan, ni faculti Public Health, College of Medicine, University of Ibadan. Mo n se iwadi yi lati mo **IMO, ISESI ATI ERO OKAN AWON IYA AWON OMO OJO TI TI DE ODUN MARUN NIPA LILO OOGUN IBA TI IJOBA FI OUNTE LU (Arthemicinin-based Combination Therapy) NI YEMETU, IJOBA IBILE IBADAN NORTH, IBADAN.**

Abajade iwadi yi yio pese imo nipa bi iya awon omo ojo ti ti de odun marun yio se ma lo oogun iba ti ijoba fi onte lu fun awon omo won ni ona ti o to ati eyi ti o ye. A ko ni se afihan ati idahun yin fun enikeni, a o si lo idahun yin fun idi ti a fin se iwadi yi nikan. E ma se ko oruko yin sinu iwe ibeere yi, a si bebe wipe ki e bawa dahun ibeere wonyin ni otito ati bi ose ye ki a le lo fun aseyori ise yi.

Nomba ti afin da iwe ibeere mo: ……

Ojo ti a dahun ibeere: ……...

Adupe lopolopo.

IPIN KINNI

Mu okan ninu awon idahun ti o wa ni isale yi ki o si toka si (√) idahun re si awon aye ( ) ti a ese sile.

a. Ibeere nipa ara re.

1. Ojo ori mi leyin ajodun ojo ibi ti o koja(ni odun)_____

2. Amin igbeyawo 1. Mi o ti gbeyawo ☐ Mo ti gbeyawo 3. ☐ ti pinya ☐ 4. Ati kora sile ☐ 5. Ajo n gbe po ☐

3. Iru esin wo le n se ☐ 1. Onigbagbo ☐ 2. Musulumi ☐ Elesin ibile ☐ 4.Esin miran (eko sile)_____

4. Eya wo ni yin 1.Yoruba ☐ 2.Igbo ☐ 3.Hausa ☐ 4.Eya miran (eko sile)_____

5a. Iru oye wo ni mo gba ninu eko 1. Iwe mefa ☐ 2. Ile eko girama ☐ 3. Oye ile eko gbogbonise ☐ 4. Oye miran (eko sile)_____

5b. Tokasi ti o ba je ile-eko giga _____

6a. Iru ise wo ni o nse? 1. Olutaja ☐ 2. Osise ijoba ☐ 3. Ise adani ☐ 4. Omiran (eko sile)_____

IFILO: Bi ko ba kin se osise ijoba, e koja si ibeere keje

6b. Bi o ba je osise ijoba, kinni ise re pato? (fun apeere adajo, olukoni ati beebee lo)

_____

7. Iru ebi ti o ni? 1. Oko kan ati iyawomeji ☐ 2. Oko kan iyawo kan ☐ 3.Ebi miran (eko sile)_____

8. Omo oojo titi de odun marun melo ni olorun jogun fun o?_____

IPIN KEJI: IMO NIPA AISAN IBA

9.0 Apoti kini kun fun awon eranko, tabi isele ti o le sokun fa aisan iba. Jowo toka si(√)

'Beeni' bi o ba je ohun ti o le fa aisan iba tabe **'Beeko'** ti ko ba le fa aisan iba; ti ko ba da loju dakun toka si '**N ko mo**.

Tabili kini

	Awon ohun ti n fa aisan iba	Tokasi (√) eyokan ninu awon ibeere		
		Beeni	**Beeko**	**N ko mo**
9.1	Efon			
9.2	Oorun pupoju			
9.3	Ayipada oju ojo			
9.4	Plasmodium (kokoro ti n fa efan)			
9.5	Ajeju epo pupa			
9.6	Ise aseju			
9.7	Aje			

10.0 Apoti keji kun fun awon ise ti o le je ki efan ma gberun si. Jowo toka si(√)

‘**Beeni’** bi o ba je ohun ti o le fa ki efan ma gberun si abi **‘Beeko’** ti ko ba le fa ki efan ma Gberun si; ti ko ba da o loju dakun toka si ‘**N ko mo**.

Tabili keji

	Awon ise tabi isele ti o le fa ki efan ma gberun si	**Tokasi(√)eyokan ninu awon ibeere**		
		Beeni	**Beeko**	**N ko mo**
10.1	**Gutter ti o di pelu omi**			
10.2	**Aida idoti si bi ti o to**			
10.3	**Omi adagun**			
10.4	**Korofo agolo tabi ike**			
10.5	**Epo engine ninu korofo ti o si sile**			
10.6.	**Omi adagun ti o epo engine ninu**			

11.0 Apoti keta kun fun amin **iba yepere.** Jowo tokasi **(√) Beeni’** bi o ba je amin iba Yepere tabi **‘Beeko’** ti ko ba kin se amin **iba yepere** ; ; ti ko ba da o loju dakun toka si **‘N ko mo’**

Tabili keta

	Amin iba yepere	**Tokasi (√) eyokan ninu awon ibeere**		
		Beeni	**Beeko**	**N ko mo**
11.1	**Ara siso tabi ti o wu**			
11.2	**Ara ti o gbona**			
11.3	**Aya rinrin**			
11.4	**Igbe sooro**			
11.5	**Eebi**			
11.6	**Otutu**			
11.7	**Irera**			
11.8	**Kata**			
11.9	**Ara riro**			
11.10	**Ara yunyun**			
11.11	**Irewesi**			
11.12	**Egbo ona ofun**			

12.0 Apoti kerin kun fun amin **Ako iba.** Jowo tokasi **(√) 'Beeni'** bi o ba je amin **ako iba** tabi **'Beeko'** ti ko ba kin se amin **Akoiba** ; ti ko ba da o loju dakun toka si **'N ko mo'**

Tabili kerin

	Amin ako iba	**Tokasi (√) eyokan ninu awon ibeere**		
		Beeni	**Beeko**	**N ko mo**
12.1	**Ara gbigbona**			
12.2	**Otutu**			
12.3	**Aisedede eya ara**			
12.4	**Eje sunsun ninu ara**			
12.5	**Iba ponju ponto**			
12.6	**Giri**			
12.7	**Mimi ti o ja gere**			
12.8	**Daku daji**			

13.0 Tabili karun kun fun awon ona ti a n gba dena aisan iba. Jowo tokasi **(√) 'Beeni'** bi o ba je ona ti a le gba dena aisan iba tabi **'Beeko'** ti ko ba kin se ona ti a Le gba dena aisan iba; ti ko ba da o loju dakun toka si **'N ko mo'**

Tabili Karun

	Ona ti a n gba dena aisan iba	**Tokasi (√) eyokan ninu awon ibeere**		
		Beeni	**Beeko**	**N ko mo**
13.1	Lilo awon apefon			
13.2	Jije ounje to n se ara lore			
13.3	Riro ayika ile ti a n gbe			
13.4	Kiko idoti koto idami nu			
13.5	Wiwe lojojumo			
13.6	Lilo kemika apefon			
13.7	Lilo oogun to n dena iba			
13.8	Sisun deede			
13.9	Aije epo pupa pupo			
13.10	Aisise ninu oorun fun igba pipe			

14.a Nje omo re ti o tip e odun marun ti ni aisan iba ri? 1. Beeni ☐ 2. Beeko ☐

14.b Nje omo re ……(ti a n toka si) ti ni aisan iba ri? 1. Beeni ☐ 2. Beeko ☐

14.c Nje omo re …….(ti a n toka si) ni aisan malaria ni osu meta seyin 1.Beeni ☐

2. Beeko ☐

IPIN C: Imo titoju arun iba ninu ile

15.0 Tabili kefa kun fun igbese ti a ma gbe bi omode ba ni aisan iba.Jowo tokasi **(√) 'Beeni'** bi o ba je igbese ti o to lati gbe tabi **'Beeko'** ti ko ba kin se igbese ti o to lati gbe; ti ko ba da o loju dakun toka si **'N ko mo'**

Tabili kefa

	Ona ti a n gba se itoju	Tokasi (√) eyokan ninu awon ibeere		
		Beeni	**Beeko**	**N ko mo**
15.1	**Fifi omi tutu nu omo lara**			
15.2	**Lilo parasitamo**			
15.3	**Lilo oogun iba ti ijoba fonte lu**			
15.4	**Agbo iba**			
15.5	**Lilo kilorokwini**			
15.6	**Lilo si ile iwosan**			

16. Nje oti gbo nipa oogun iba ti ijoja fo nte lu ri (ACT)? 1. Beeni ☐ 2. Beeko ☐

17.0 Tabili kefa se afihan bi a se le lo oogun iba fun awon omode bi ojo ori won ti mo.

Jowo tokasi **(√) 'Beeni'** ti o ba ba ilana lilo mu tabi **'Beeko'** tiko ba ba ilanalilo mu;

ti ko ba da o loju dakun toka si **'N ko mo'**

Tabili keje

S/N	Ojo ori ni osu	Iye oogun fun lilo	Tokasi (√) eyokan ninu awon ibeere		
			Beeni	**Beeko**	**N ko mo**
17.1	Osu 6 – odun 3	Horo oogun kan leemeji lojumo fun ojo meta			
17.2		Horo oogun meji leemeji lojumo fun ojo meta			
17.3		Horo oogun kan leemeta lojumo fun ojo meta t			
17.4	Odun3 – odun5	Horo oogun kan leemeji lojumo fun ojo meta			
17.5		Horo oogun meji leemeji lojumo fun ojo meta			
17.6		Horo oogun meta leemeta lojumo fun ojo meta			

Table 8 0 Tabili kejo se afihan bi a se le lo oogun parasitamo fun awon omode bi ojo ori won ti Mo. Jowo tokasi **(√) 'Beeni'** ti o ba ba ilana lilo mu tabi **'Beeko'** tiko ba ba ilanalilo mu;

ti ko ba da o loju dakun toka si **'N ko mo'**

Tabili kejo

S/N	Ojo ori ni osu	Iye oogun parasitamo fun lilo	Tokasi (√) eyokan ninu awon ibeere		
			Beeni	**Beeko**	**N ko mo**
18.1	Osu 6 – odun 3	Ilaji horo oogun kan leemeta lojumo fun ojo meta			
18.2		Horo oogun kan leemeta lojumo fun ojo meta			
18.3		Ilaji horo oogun kan leemkan lojumo fun ojo meta			

18.4	Odun3 – odun5	Horo oogun kan leemeji lojumo fun ojo meta			
18.5		Horo oogun kan leemeta lojumo fun ojo meta			
18.6		Horo oogun leekan lojumo fun ojo meta			

19. Igba wo ni o dara ju lati se itoju omo oojo titi de odunmarun ti o ba ni arun iba? 1. Leyin ojo meji ☐ 2. Laarin oojo ☐ 3. Lesekese ☐4. Nigba ti ami iba si n jeyo ☐ 5. Omiran (e salaye)_____

20.(a) Nje o ti gbo nipa oogun ti o n dena aarun iba ti iya le tibo idi omode ko to gbelo sile Iwosan nigba aibamo ti o ba je ako iba? 1. Beeni ☐2. Beeko ☐

20.(b) Bi o ba je beeni si ibeere **20(a),** kinni oruko oogun na? _____

IPIN D: Isesi nipa itoju aarun iba

21. (a) Nje o ti lo oogun ti n dena ibari fun omo re ri? 1. Beeni2.B☐ko ☐

Ti o ba je beeni si ibeere 21a, dahun ibeere 21b. bi o ba je beeko si ibeere 21a koja lo si ibeere 22

21b. Ti o ba je beeni,kini oruko oogun ti o lo fun omo re? _____

22. Oogun wo lo lo nigbati omo re ni arun iba keyin? 1. Coartem ☐ 2. Ampclox ☐

3. Artesunate ☐4. Choloquine☐ 5. Paracetamol ☐6. Omiran (tokasi)_____

23. Iru oogun to n dekun ara riro ewo lo lo pelu oogun iba fun omore? 1. Paracetamol ☐

2. Novagen ☐ 3. Ibuprofen4.☐abukun 5☐miran(tokasi)_____

24. Nibo lo ti gba itoju nigba ti omo re ba ni aisan iba kanyin?1. Soobu ita oogun ☐. Awon Ti o n pin oogun ladugbo ☐3. Ile iwosan adugbo ☐4. senta ☐ 5. Ile iwosan ☐

6. Ile iwosan aladani ☐ 7. Ile ijosin ☐8. Awon agbebi ibile 9. Omiran(tokasi)_____

25. Nibo ni o ma n toju oogun re si leyin ti o ba ra? 1. Ibi ti o gbe tosi tutu ☐. Inu ora ☐

3. Inu koboodu ikaso si ☐ 4. Iyara idana ☐ 5. Omiran (tokasi)_____

26. jowo salaye bi o ti n se itoju omo oojo de odun marun re bi o ba ni aisan iba._____

_____

SECTION E: Irisi lori bi eniyan se le se alabapade arun iba, bi o se lewu to, ati itoju re.

27. 0 Tabili kesan kun ero okan re nipa aarun iba: Fun ikookan jowo tokasi (√) bi o ba **faramo**, bi iwo **ko ba faramo** tabi **ti o ba da o loju.**

Tabili kesan

	Statements	**Tokasi (√) eyokan ninu awon ibeere**		
		Mogba	**Mi o mo**	**Miogba**
27.1	Omo mi ko le ni aisan iba nitorina, mi o ni lati mo se idena re			
27.2	Igbagbo mi nip e aisan iba je aisan awon ti ko lowo lowo, omo o le ni nitoripe a lowo lowo			
27.3	Mi o Gbagbo wipe aisan iba je aisan ti o le fun omode			
27.4	Oso ati aje lon fa aisan iba, nitorina siso fun nipa oogun lilo je fifi asiko sofo			
27.5	Aisan iba ko le sokun fa iku omo oojo si omo odun marun			
27.6	Igbagbo mi ni pe aisan iba yoo lo fun ra re laisetoju re tabi loogun			
27.7	Mo ri daju wipe omo mi ma n jina si awon eniyan tabi omo miran to ba ni aisan iba, kon ma ba ko ran			
27.8	Ero mi nip e omo ti a ba fun ni ounje dada ko le laarun iba			

28. 0 Tabili kewa kun fun ero okan re nipa titoju aarun iba nile: Fun ikookan jowo tokasi (√) bi o ba **faramo**, bi iwo **ko ba faramo** tabi **ti o ba da o loju.**

Tabili kewa

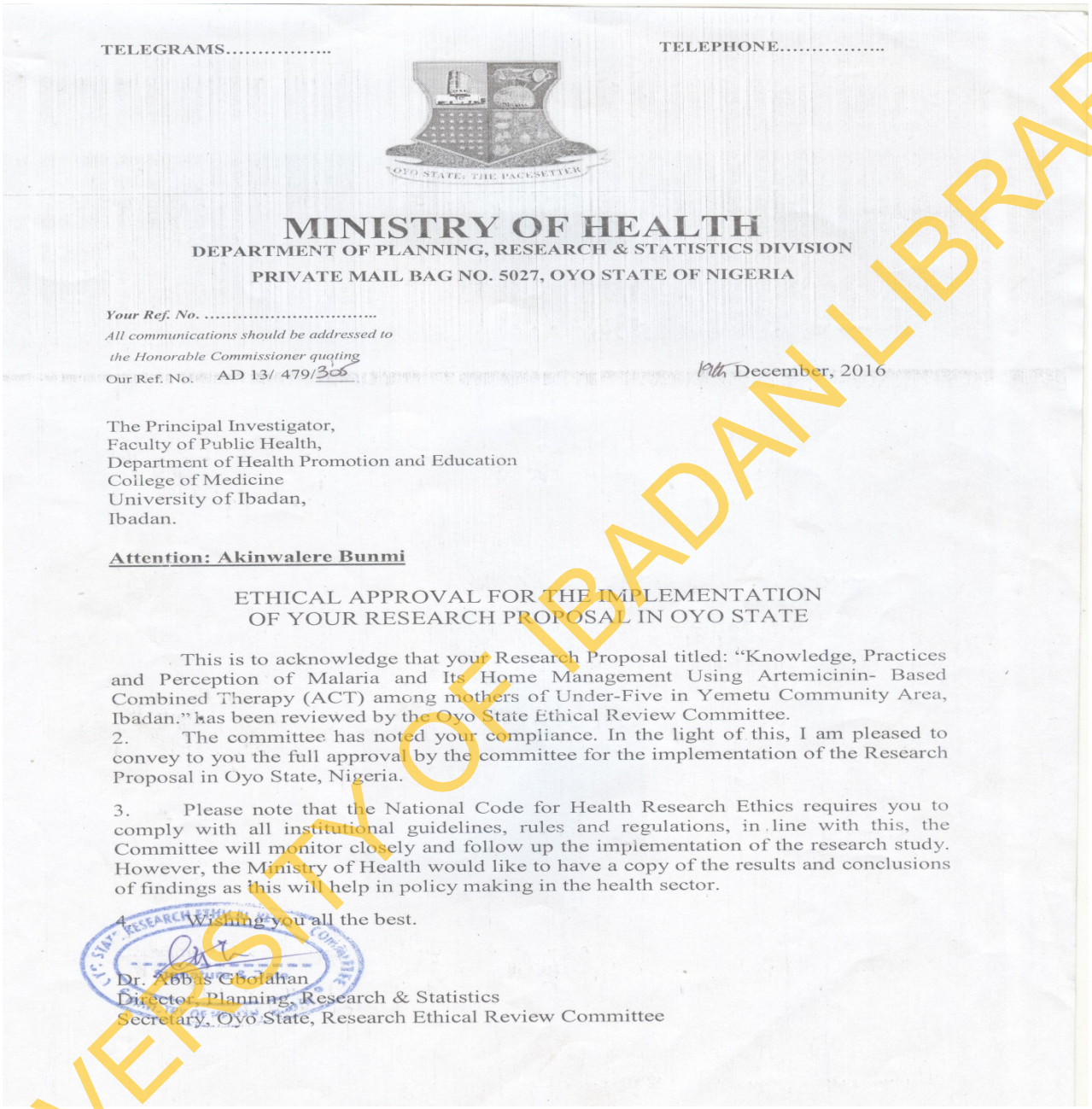
	Statements	**Tokasi (√) eyokan ninu awon ibeere**		
		Mogba	**Mi o mo**	**Miogba**
28.1	Mo nigbagbo wipe chloroquine nikan ti to lati se itoju omomi ti o ba ni aisan iba			
28.2	Ero mi nipe nigba ti aisan ba le nikan ni ki a lo oogun iba(coartem) ti ijoba fo nte lu fun omode ni ile.			
28.3	Chloroquine ni o dara ju fun itoju iba lara omode ju oogun iba ti ijoba founte lu (ACT) lo (fun apere: coartem, artesunate etc)			
28.4	Ako lo oogun iba tito lati setoju omo ti o bani aisan iba			
28.5	Agbo iba ni o dara ju lati se itoju arun iba fun awon omo oojo titi de odun marun ni toripe ko won			
28.6	Oogun ibile lilo ninu ile lo sise ju lati wo aisan iba lara omo oojo de odun marun			
28.7	Odara lati duro fun ojokan tabi meji lati ri daju wipe omo oojo de odun marun ni aisan ki a to ma se itoju re ninu ile pelu oogun iba			
28.8	Ose pataki ki gbogbo iya ma toju oogun sile fun			

	itoju iba nile ti lilo re ba jeyo.			
28.9	Ko bojumu ki iya ma se itoju omo oojo si odun marun nile ti o ba ni aisan iba.			

Mo Gbagbo wipe chloroquine nikan to lati setoju arun iba iyowun ki o je fun omo mi

APPENDIX IV

ETHICAL APPROVAL



TELEGRAMS..... TELEPHONE.....

OYO STATE: THE PACESETTER

MINISTRY OF HEALTH

DEPARTMENT OF PLANNING, RESEARCH & STATISTICS DIVISION

PRIVATE MAIL BAG NO. 5027, OYO STATE OF NIGERIA

Your Ref. No. .....
All communications should be addressed to
the Honorable Commissioner quoting
Our Ref. No. AD 13/ 479/305

19th December, 2016

The Principal Investigator,
Faculty of Public Health,
Department of Health Promotion and Education
College of Medicine
University of Ibadan,
Ibadan.

Attention: Akinwalere Bunmi

ETHICAL APPROVAL FOR THE IMPLEMENTATION
OF YOUR RESEARCH PROPOSAL IN OYO STATE

This is to acknowledge that your Research Proposal titled: "Knowledge, Practices and Perception of Malaria and Its Home Management Using Artemicinin- Based Combined Therapy (ACT) among mothers of Under-Five in Yemetu Community Area, Ibadan." has been reviewed by the Oyo State Ethical Review Committee.

2. The committee has noted your compliance. In the light of this, I am pleased to convey to you the full approval by the committee for the implementation of the Research Proposal in Oyo State, Nigeria.

3. Please note that the National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations, in line with this, the Committee will monitor closely and follow up the implementation of the research study. However, the Ministry of Health would like to have a copy of the results and conclusions of findings as this will help in policy making in the health sector.

4. Wishing you all the best.

Dr. Abbas Gbolahan
Director, Planning, Research & Statistics
Secretary, Oyo State, Research Ethical Review Committee