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Assessment of Mother's Knowledge and Attitude on Prevention of Malaria among Under (5) Years Children in Selected Primary Health Centers, Lagos State.

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ABSTRACT

This research was carried out to assess mothers' knowledge and attitude on prevention of malaria among under (5) years children in selected primary health centers in Lagos State. The objectives of this study were to determine their current level of knowledge and skills in term of disease identification, management and transmission of malaria; evaluate the effectiveness of insecticide-treated net in the prevention of malaria among them; assess their knowledge on the use of Artemisinin-based combination therapy (ACT) in the treatment of malaria; and evaluate the factors affecting them in the prevention of malaria among under-five children. A simple random sampling technique was used in selecting eighty-seven (87) caregivers, but only eighty-four (84) of them were validated for the study. A self-developed questionnaire served as the primary instrument of data collection for the study,data collected were analyzed and presented on frequency/percentage tables, and bar chart(s) using Statistical Package for Social Sciences (SPSS) version 25 and Microsoft Excel version 2010. The findings revealed that they exhibited an overall good level of knowledge, positive attitude, and good level of practice of malaria prevention among under-five children. The assessment of factors affecting in prevention of malaria among under-five children revealed that majority (88.1%) are married; 71.4% live in urban area; 64.3%are Christians; 59.5% self-employed; 52.4% have child who is not under five years of age; 47.6% have tertiary level of education; 40.5% have an under-five child; while 33.3% are 26-30 years of age. The study found significant relationship

between the mothers' knowledge and attitude towards prevention of malaria among under-five children ($p < .05$). Based on these findings, the study concluded that there is need to ensure consistency and improve their practice of malaria prevention through proper evaluation and amelioration of their knowledge and attitude towards prevention of malaria among under-five children.

Keywords: Attitude, Knowledge, Malaria, Mothers, Prevention, Under-five children

CHAPTER ONE
INTRODUCTION
1.1 BACKGROUND TO THE STUDY

Malaria continues to pose a significant public health challenge, particularly among children under five years old, emphasizing the need for effective preventive strategies and interventions to alleviate the disease's impact. Despite ongoing efforts to combat malaria, gaps in knowledge and awareness of preventive measures among mothers of young children persist, underscoring the necessity of assessing maternal understanding to design targeted interventions.Malaria is a mosquito-borne infectious disease affecting humans and

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other animals (WHO, 2022). Its symptoms typically include fever, fatigue, vomiting, and headaches. In severe cases, it can lead to jaundice, seizures, coma, or even death (Dahalan et. al., 2018). Symptoms usually manifest 10 to 15 days after being bitten by an infected mosquito. Without proper treatment, the disease may recur months later (WHO, 2022).The illness is caused by single-celled microorganisms from the Plasmodium genus and is transmitted exclusively through bites from infected Anopheles mosquitoes (Walter & John, 2022). During a bite, the mosquito introduces parasites from its saliva into the bloodstream. These parasites travel to the liver, where they mature and reproduce. Five Plasmodium species are known to infect and be transmitted among humans.Most malaria-related deaths are caused by *Plasmodium falciparum*, while *Plasmodium vivax*, *Plasmodium ovale*, and *Plasmodium malariae* typically cause less severe disease in humans. Malaria is commonly diagnosed through microscopic examination of blood using blood films or with antigen-based rapid diagnostic tests. Although polymerase chain reaction (PCR) methods for detecting the parasite's DNA have been developed, they are not widely utilized in high-malaria regions due to their cost and complexity.The risk of malaria can be reduced by preventing mosquito bites through mosquito nets, insect repellents, and mosquito-control measures such as insecticide spraying and draining standing water (Caraballo & King, 2018). Travelers to malaria-endemic areas can take preventive medications, while occasional doses of the combination drug sulfadoxine/pyrimethamine are recommended for infants and pregnant women after the first trimester in high-risk regions.As of 2020, one vaccine has been shown to reduce malaria risk by approximately 40% in African children (WHO, 2020). A preprint study on another vaccine reported a 77% efficacy rate, though this finding has not yet undergone peer review (Datoo et al., 2021). Research into more effective vaccines continues.The recommended treatment for malaria is a combination of antimalarial drugs, including artemisinin, paired with either mefloquine, lumefantrine, or sulfadoxine/pyrimethamine. If artemisinin is unavailable, quinine with doxycycline may be used. In malaria-endemic areas, confirmation of the disease before initiating treatment is advised to minimize the risk of increasing drug resistance (WHO Malaria Report, 2022).Resistance to several antimalarial drugs has emerged, including widespread resistance to chloroquine by *P. falciparum* and growing resistance to artemisinin in parts of Southeast Asia (WHO, 2018).Malaria is a widespread tropical disease with significant morbidity, mortality, and profound economic and social impacts. *Plasmodium falciparum* is the deadliest malaria parasite and the most prevalent in Africa, while *Plasmodium vivax* is dominant in many countries outside sub-Saharan Africa (WHO, 2021). According to the latest World Malaria Report, there were 247 million malaria cases in 2021, up slightly from 245 million in 2020. Malaria-related deaths were estimated at 619,000 in 2021, a decrease from 625,000 in 2020.The WHO African Region bears the heaviest malaria burden globally, accounting for approximately 95% of all malaria cases and 96% of deaths in 2021. Children under 5 years old represented about 80% of all malaria deaths in the region. Four African countries contributed to over half of global malaria deaths: Nigeria (31.3%), the Democratic Republic of the Congo (12.6%), the United Republic of Tanzania (4.1%), and Niger (3.9%).The rising prevalence of malaria in Nigeria can be attributed to both behavioral and non-behavioral factors. Behavioral factors include cultural practices

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that promote mosquito breeding, inadequate use of proven preventive and treatment measures, and delays in seeking appropriate care. Non-behavioral factors encompass geographical and ecological conditions, the availability of mosquitoes, and the presence of plasmodium parasites.A comprehensive understanding of these factors is essential for developing effective interventions to combat malaria. Raising awareness and enhancing knowledge about malaria transmission have been shown to significantly reduce the disease burden and support the sustainability of malaria elimination programs.Against this backdrop, this study explored the knowledge, attitudes, and practices of mothers concerning malaria prevention in children aged 0-5 years. While advancements in new drugs and vaccines have been made, the complete eradication of malaria remains a distant goal. Consequently, many health strategies now prioritize malaria prevention and control. Rural populations in Africa are often characterized by poverty, limited awareness, and insufficient resources, with inadequate social infrastructure making them more vulnerable to diseases like malaria. As a result, numerous intervention measures have been aimed at reducing morbidity and mortality rates in these communities. The community selected for this study has a known history of high malaria prevalence.

1.2 STATEMENT OF PROBLEM

According to the 2021 World Malaria Report by the World Health Organization, children under five remain the most vulnerable group affected by malaria, accounting for 67% of all malaria-related deaths.

This heightened susceptibility is attributed to their underdeveloped immune systems. Dr. Osagie Ehanire, the Minister of Health, highlighted these statistics while presenting the Ministry of Health's scorecard during the administration of President Muhammadu Buhari (2015–2023). Malaria control and elimination efforts in Nigeria are overseen by the National Malaria Elimination Programme within the Department of Public Health at the Federal Ministry of Health. Other notable communicable diseases in the country include HIV, tuberculosis, and measles.

At the launch of the 2021 Nigeria Malaria Indicator Survey, Dr. Ehanire reported that malaria accounts for 60% of outpatient visits to healthcare facilities, 30% of childhood deaths, 11% of maternal deaths (with 4,500 deaths annually), and 25% of deaths among infants (children under one year old).The rising prevalence of malaria in Nigeria is influenced by both behavioral and non-behavioral factors. Behavioral factors include cultural practices that foster mosquito breeding and increase human exposure, as well as the failure of at-risk populations to promptly and adequately use proven malaria prevention, treatment, and control technologies. Non-behavioral factors involve geographical or ecological conditions, the availability of mosquitoes, and the presence of plasmodium parasites. Understanding these factors is crucial for designing effective interventions to combat malaria. Raising awareness and enhancing knowledge about malaria transmission are key strategies in mitigating the disease's impact and supporting sustainable malaria elimination programs. The growing resistance of *Plasmodium falciparum* to both drugs and insecticides further complicates efforts to combat malaria. Against this backdrop, this paper explores the knowledge, attitudes, and practices of mothers regarding malaria prevention in children under five years old. The study aims to assess mothers' knowledge, attitudes, and practices related to the prevention of malaria among children in this age group.

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1.3 OBJECTIVE OF THE STUDY

1. To determine the current level of knowledge and skills of mothers in term of disease identification, management and transmission of malaria.
2. To evaluate the effectiveness of insecticide treated net (ITN) in the prevention of malaria.
3. To assess the knowledge of mothers on the use of Artemincin combination therapy (ACT) in the treatment of malaria.
4. To evaluate the factors affecting mothers in the prevention of malaria among under 5 years children.

1.4 RESEARCH QUESTION

What is the knowledge level of mothers about malaria in under-five children do mothers possess?

What are the demographic and socio-cultural factors that may influence their knowledge, attitudes and practices regarding malaria in under-five children?

What is the treatment-seeking behaviors of mothers relating to malaria in children under-five years old?

1.5 HYPOTHESES

H_0 – There is no significant difference on the mother's knowledge and attitude on the prevention of malaria among the under five children.

1.6 SIGNIFICANCE OF THE STUDY

The findings of this study will be of major importance in assessing the knowledge and attitude of mothers on prevention of malaria among under (5) years children. The findings will also benefit in the fight towards the eradication and fight against malaria.

1.7 SCOPE OF STUDY

This study is on assessing of mother's knowledge and attitude on prevention of malaria among under (5) years children in selected Primary health centers Lagos.

1.8 OPERATIONAL DEFINITION OF TERMS

Attitude - Attitude is how one thinks, behaves and feels about something.This research explores mother's attitude towards malaria and its prevention and treatment in under-five children.

Knowledge - It is the state of knowing something. This includes information, understanding and skills gained through either education or experience.

Malaria - Malaria is **a life-threatening disease caused by parasites that are transmitted to people through the bites of infected female** Anopheles mosquitoes.

Malaria control: is a process that requires eradicating the carrier mosquito or reducing man-vector contact so as to cut in the life – cycle of the parasite.

Malaria deaths - The death of the child is confirmed by the clinician stating that malaria is one of the medical diagnoses from which the child died.

Malaria management - refers to the whole process of recognition of the causes, symptoms and transmission of malaria and seeking health care for its treatment promptly.

Practice - Practice is a habit or custom that is carried out regularly. This study focused on what mothers do to assist an under-five year child attacked by malaria.

Prevention – Activities to **prevent** illness such as routine check-ups, immunizations, patient counseling, and screenings.

CHAPTER 2

LITERATURE REVIEW

2.1 CONCEPTUAL REVIEW

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The Disease Malaria

Malaria is a disease caused by protozoa of the *Plasmodium* genus, transmitted to humans through the bite of female *Anopheles* mosquitoes. Predominantly occurring in tropical regions, malaria is a potentially life-threatening parasitic infection caused by *Plasmodium* species. The five species known to cause malaria in humans are *P. falciparum*, *P. vivax*, *P. ovale*, *P. malariae*, and *P. knowlesi*. Timely identification of the infecting species is crucial, as *P. falciparum* infections can be fatal and are often resistant to chloroquine. *P. falciparum* and *P. vivax* account for most new infections (Thomas et al., 2020). The *Plasmodium* species can generally be distinguished by their morphology on a blood smear. *P. falciparum* is notable for its high parasitemia levels and the banana shape of its gametocytes. Approximately 5–7% of malaria cases involve co-infection with more than one *Plasmodium* species, and such co-infections have also been observed in mosquito vectors. Each *Plasmodium* species has specific endemic regions, though geographic overlaps are common. Malaria risk is highest for individuals living in or traveling to regions such as Central and South America, Hispaniola, sub-Saharan Africa, the Indian subcontinent, Southeast Asia, the Middle East, and Oceania. Among these, sub-Saharan Africa has the highest rate of *P. falciparum* transmission to travelers from the United States. In 2020, there were approximately 241 million cases of malaria globally, leading to an estimated 627,000 deaths. Sub-Saharan Africa accounted for about 95% of these cases and fatalities. While malaria rates declined between 2010 and 2014, they rose again from 2015 to 2020. The disease is closely linked to poverty and significantly hinders economic development. In Africa, malaria is estimated to cause economic losses of around $12 billion annually, attributed to higher healthcare expenses, reduced workforce productivity, and negative impacts on tourism.

History of Malaria

Malaria's history dates back to its prehistoric origins as a zoonotic disease in African primates, extending to its widespread impact in the 21st century. Once a globally prevalent and potentially deadly disease, malaria affected all continents except Antarctica at its peak. Efforts to prevent and treat the disease have been a focus of scientific and medical research for centuries. Since the discovery of the Plasmodium parasites responsible for malaria, research has centred on understanding the biology of the parasites and the mosquitoes that transmit them.Malaria's periodic fevers are mentioned in historical records dating back to the first millennium BC in Greece and China. For thousands of years, various traditional herbal remedies were used to treat the disease.

The first effective treatment for malaria was derived from the bark of the cinchona tree, which contains quinine. After the connection between mosquitoes and the Plasmodium parasite was established in the early 20th century, mosquito control strategies were introduced, including widespread use of the insecticide DDT, draining swamps, oiling or covering open water sources, indoor residual spraying, and using insecticide-treated nets. Quinine was also used preventively in malaria-endemic areas, while new drugs like chloroquine and artemisinins were introduced to combat the disease.Today, artemisinin-based therapies are the standard for treating malaria. The introduction of artemisinin in combination with other treatments led to a significant reduction in malaria mortality in Africa by half, though the rates later partially rebounded. Efforts to fight malaria continue to evolve, focusing on both treatment and prevention (Wikipedia contributors, 2023)

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Knowledge and Skills of Mothers in Term of Disease Identification, Management and Transmission of Malaria.

Malaria remains a critical public health issue in Nigeria, with high prevalence and incidence rates nationwide. It is one of the leading causes of illness and death, especially among vulnerable groups such as pregnant women and young children. Mothers, as primary caregivers, play a pivotal role in identifying malaria symptoms, seeking timely treatment, and adopting preventive measures for their families.The level of malaria knowledge among mothers in Nigeria varies based on factors such as education, access to healthcare, socioeconomic status, and location. Mothers in urban areas and those with higher education levels generally exhibit greater awareness of malaria symptoms, transmission, and prevention strategies compared to those in rural settings (Paul et al., 2019). Awareness campaigns, community health education initiatives, and antenatal care programs have helped enhance mothers' understanding of the importance of early diagnosis, prompt treatment, and preventive measures such as insecticide-treated bed nets and intermittent preventive treatment during pregnancy (WHO, 2018).Despite these advancements, challenges persist. Some mothers continue to harbor misconceptions about malaria, its causes, and the appropriate treatments. Cultural beliefs and traditional practices may influence healthcare decisions, sometimes delaying timely medical intervention.Limited access to healthcare services, particularly in remote areas, hampers the timely and accurate diagnosis and treatment of malaria cases. Challenges such as the affordability and availability of antimalarial medications further affect treatment outcomes. Research on mothers' knowledge and practices regarding malaria has highlighted existing gaps and offered valuable insights for targeted interventions. Health education programs tailored to the cultural context and local beliefs have demonstrated potential in enhancing mothers' understanding and practices related to malaria prevention and management (Paul et al., 2019).

To mitigate the malaria burden among mothers in Nigeria, sustained investment in comprehensive malaria control strategies is vital. These strategies should encompass health education, preventive measures, prompt and accurate diagnosis, and effective treatment. Strengthening healthcare infrastructure in remote regions and ensuring access to affordable, high-quality healthcare services are critical steps in reducing malaria's impact on mothers and their families (WHO, 2023).

Prevalence of Malaria

Malaria remains a significant global health issue, particularly in tropical and subtropical regions. According to the World Health Organization (WHO), there were an estimated 241 million cases of malaria worldwide in 2020. Sub-Saharan Africa bears the highest burden, accounting for approximately 94% of all malaria cases and deaths globally. The prevalence is especially pronounced in this region due to favourable conditions for mosquito breeding and limited access to healthcare services. The disease significantly contributes to morbidity and mortality, particularly among children under five years of age and pregnant women.Nigeria experiences one of the highest malaria burdens globally, accounting for nearly 25% of all malaria cases worldwide. The disease is endemic throughout most parts of the country, with year-round transmission and seasonal fluctuations. Malaria remains a leading cause of death in Nigeria, particularly affecting vulnerable groups such as children and pregnant women. The public health challenge posed by malaria in Nigeria is

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exacerbated by factors such as inadequate access to healthcare, insufficient preventive measures, and limited funding for control programs. Furthermore, the disease imposes a substantial economic toll on the nation through healthcare expenses, lost productivity, and other related costs.

Use of Artemisinin Combination Therapy (ACT) In the Treatment of Malaria

To mitigate the burden of malaria, the World Health Organization (WHO) recommends artemisinin-based combination therapy (ACT) for treating uncomplicated malaria, provided the diagnosis is confirmed through microscopy or rapid diagnostic tests (RDTs). This approach aims to minimize the inappropriate use of ACTs. In line with these guidelines, the Nigerian government adopted the use of ACTs for uncomplicated malaria treatment in 2005.

However, challenges such as the unavailability and inaccessibility of healthcare facilities, particularly in rural areas, hinder the effective delivery of malaria treatment services. Malaria care is often sought through various providers, including government-accredited health facilities and drug retail outlets such as pharmacies and patent medicine dealers (PMDs). Research has shown that these drug retail outlets frequently fail to provide effective malaria management and treatment.PMDs are licensed outlets operated by attendants who are not trained pharmacists but are authorized to sell over-the-counter medications, including analgesics and antimalarials. In contrast, pharmacies are retail establishments staffed by trained pharmacists whose practices are regulated by pharmacy law in Nigeria. Despite this, many patients prefer the informal sector due to its accessibility, affordability, and convenience, even though treatment provided in such settings is often inconsistent with national treatment guidelines and may not be appropriate.

The growing reliance on informal sectors for malaria management and treatment has become a significant public health challenge. For example, both sellers and consumers often lack the necessary knowledge about the correct dosage and duration of treatment. To enhance malaria case management within communities, strategies such as providing health education to caregivers and training community volunteers in managing malaria in children have been implemented. Health education has proven effective in promoting early diagnosis and ensuring appropriate treatment by caregivers in the home management of malaria. (Uzochukwu et. al., 2018).

Diagnosis

Given the non-specific nature of malaria symptoms, diagnosis is typically based on clinical suspicion from symptoms and travel history, followed by laboratory confirmation to detect the parasite in the blood (parasitological testing). In malaria-endemic regions, the World Health Organization (WHO) advises clinicians to consider malaria in any individual reporting fever or presenting with a temperature above 37.5°C without an obvious cause (WHO, 2021). In children, malaria should also be suspected when signs of anemia, such as pale palms or hemoglobin levels below 8 grams per deciliter, are observed (WHO, 2021). In areas with minimal or no malaria transmission, testing is recommended only for individuals with potential exposure to malaria, such as recent travel to endemic regions, and unexplained fever (WHO, 2021).Malaria diagnosis is typically confirmed through microscopic examination of blood films or antigen-based rapid diagnostic tests (RDTs). Microscopy, involving the examination of Giemsa-stained blood under a light microscope, remains the gold standard for malaria diagnosis (Ashley, 2018). This process

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includes assessing a "thick film" to scan numerous blood cells quickly and a "thin film" to identify specific parasites and determine the Plasmodium species (Ashley, 2018). Under typical field conditions, microscopy can detect parasites at levels of at least 100 parasites per microliter of blood, which aligns with the lower threshold for symptomatic infection (WHO, 2021).Microscopic diagnosis of malaria is resource-intensive, requiring skilled personnel, specialized equipment, electricity, and a steady supply of microscopy slides and stains (WHO, 2021). In settings where microscopy is unavailable, rapid diagnostic tests (RDTs) are used. These tests detect parasite proteins in a fingerstick blood sample and provide a quick diagnosis (WHO, 2021). Different RDTs target specific parasite proteins, including histidine-rich protein 2 (HRP2, specific to *P. falciparum*), lactate dehydrogenase, and aldolase (WHO, 2021). HRP2 tests are widely utilized in Africa, where *P. falciparum* is predominant (Ashley, 2018). However, HRP2 can remain in the blood for up to five weeks after successful treatment, making it difficult to distinguish between active and past infections (WHO, 2021). Additionally, some *P. falciparum* strains in the Amazon region lack the HRP2 gene, complicating detection (WHO, 2021).

RDTs are fast and suitable for deployment in areas lacking comprehensive diagnostic laboratories (WHO, 2021). However, they provide less detailed information than microscopy and may vary in quality across manufacturers and batches (WHO, 2021).

Although serological tests to detect antibodies against *Plasmodium* have been developed, they are not used for malaria diagnosis due to low sensitivity and specificity. Similarly, highly sensitive nucleic acid amplification tests exist but are not employed clinically because of their high cost and limited ability to differentiate active infections from past ones (WHO, 2021).

Classification of Malaria

Malaria is classified into uncomplicated malaria and severe malaria.

Uncomplicated malaria

Uncomplicated malaria is defined as the presence of malaria symptoms in a patient with a positive parasitological test result (microscopy or RDT) but without any signs of severe malaria (WHO, 2023).

Severe Malaria

Severe malaria is a life-threatening condition characterized by the presence of *P. falciparum* in peripheral blood along with specific clinical and laboratory features. These features include:

- **Prostration:** Difficulty or inability to sit upright, stand, or walk without support in a child who normally can, or inability to drink in children too young to sit.
- **Altered consciousness:** Ranging from drowsiness to deep coma.
- **Cerebral malaria:** Unresponsive coma not attributed to any other cause in a patient with *P. falciparum* malaria.
- **Respiratory distress.**
- **Multiple generalized convulsions.**
- **Circulatory collapse:** Shock potentially caused by septicemia.
- **Pulmonary edema.**
- **Jaundice and hemoglobinuria.**
- **Acute renal failure.**
- **Severe anemia:**Hemoglobin levels <5 g/dl or hematocrit<15%.
- **Hyperparasitemia:** Parasite density >200,000/µl in high transmission areas or >100,000/µl in low transmission areas

Cerebral Malaria

Cerebral malaria is a severe form of *P. falciparum* malaria characterized by

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neurological symptoms, including coma. It is defined as a Glasgow Coma Scale score of less than 11 or a Blantyre Coma Scale score below 3, or a coma persisting for more than 30 minutes following a seizure (WHO, 2023).

Prevention

Malaria prevention methods include the use of medications, mosquito control, and preventing mosquito bites. As of 2020, the RTS,S malaria vaccine, the first licensed vaccine for malaria, is available. The RTS in its name refers to the engineered genes from the repeat (R) and T-cell epitope (T) of the circumsporozoite protein (CSP) of the *Plasmodium falciparum* malaria parasite, combined with a viral surface antigen (S) from the hepatitis B virus (HBsAg) (WHO, 2023). The occurrence of malaria in a region is influenced by factors such as high human and Anopheles mosquito population densities and efficient transmission between humans and mosquitoes. If any of these factors are sufficiently reduced, the parasite can be eliminated from the area, as seen in North America, Europe, and parts of the Middle East. However, without global eradication, the parasite could re-emerge if conditions conducive to its reproduction return. Additionally, the cost of eliminating Anopheles mosquitoes increases as population density decreases, making it economically impractical in certain regions.While malaria prevention might be more cost-effective in the long term compared to treatment, the initial costs are often out of reach for the poorest populations. The expenses for control and elimination programs vary significantly between countries. For instance, China's malaria elimination strategy, introduced in 2010, required a relatively small portion of the public health budget, whereas a similar initiative in Tanzania would cost about one-fifth of their health budget. In 2021, the World Health Organization confirmed that China had successfully eliminated malaria (WHO, 2022).In regions where malaria is prevalent, children under five often suffer from anemia, which can sometimes be caused by malaria. Administering preventive antimalarial medication to anemic children in these areas may slightly improve their red blood cell counts, but it does not reduce the risk of death or the need for hospitalization (White, 2018).

Mosquito control

Vector control involves strategies aimed at reducing malaria transmission by mosquitoes. The most effective insect repellents for personal protection are those containing DEET or picaridin. However, there is limited evidence to suggest that mosquito repellents alone can prevent malaria infection (Maia et al., 2018). Insecticide-treated nets (ITNs) and indoor residual spraying (IRS) have been widely used and proven effective in reducing malaria transmission, contributing significantly to its decline in the 21st century (Fox et al., 2021).

However, these interventions may not fully eradicate the disease, as their effectiveness depends on factors such as widespread use, coverage gaps in insecticide protection, lack of outdoor protection, and growing mosquito resistance to insecticides (Fox et al., 2021). Long-term prevention strategies may require modifications to housing to reduce exposure to mosquitoes (Fox et al., 2021).

Insecticide treated net

Mosquito nets are effective in preventing mosquitoes from reaching people, thereby reducing malaria transmission and infection rates. While nets are not a perfect barrier, they are often treated with insecticides that kill mosquitoes before they can pass through. Insecticide-treated nets (ITNs) are considered twice as effective as untreated nets and offer over 70% protection compared to not using a net at all. Between

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2000 and 2008, ITN use is estimated to have saved 250,000 infant lives in Sub-Saharan Africa (WHO, 2018). In 2007, about 13% of households in Sub-Saharan Africa owned ITNs, and by 2008, 31% of African households had at least one ITN. The number of African children using ITNs grew from 1.7 million (1.8%) in 2000 to 20.3 million (18.5%) in 2007, although 89.6 million children remained unprotected. By 2015, 68% of African children were using mosquito nets (WHO, 2018). Most nets are treated with pyrethroids, which are insecticides with low toxicity, and are most effective when used from dusk to dawn. It is recommended to hang a large bed net over a bed, ensuring the edges touch the ground or are tucked under the mattress. ITNs improve pregnancy outcomes in malaria-endemic areas in Africa, though more research is needed for Asia and Latin America. In regions with high malaria resistance, nets treated with a combination of pyrethroids and piperonyl butoxide (PBO) have proven effective in reducing infection rates (Gleave et al., 2021). However, concerns exist about the durability of PBO-treated nets, as mosquito mortality impact was not sustained after twenty washes in trials (Gleave et al., 2021).

Indoor residual spraying

Indoor residual spraying (IRS) involves applying insecticides to the walls inside homes. After mosquitoes feed, they often rest on nearby surfaces to digest their blood meal, so if the walls are treated with insecticides, mosquitoes can be killed before they bite again and spread the malaria parasite. The World Health Organization (WHO) has recommended 12 insecticides for IRS operations since 2006, including DDT and pyrethroids like cyfluthrin and deltamethrin. The use of small amounts of DDT for public health purposes is allowed under the Stockholm Convention, which bans its agricultural use. A challenge with IRS is insecticide resistance. Mosquitoes exposed to IRS often prefer to rest indoors, but over time, due to irritation from the spraying, their descendants tend to rest outdoors, making them less affected by IRS. Studies have shown that communities using insecticide-treated nets along with IRS using non-pyrethroid insecticides experienced reductions in malaria (Pryce et al., 2022). However, using pyrethroid-like insecticides in addition to IRS did not show additional benefits in areas already using insecticide-treated nets (Pryce et al., 2022).

Housing modification

Housing can be a significant risk factor for malaria, and modifying the home as a preventive measure may provide a sustainable solution that does not rely on insecticides like pyrethroids (Fox et al., 2021). The physical environment both inside and outside the home plays a role in mosquito density and transmission risk. Factors to consider include the proximity of the home to mosquito breeding sites, nearby drainage and water sources, availability of resting sites for mosquitoes (such as surrounding vegetation), proximity to livestock and domestic animals, and possible physical modifications to the home's design to prevent mosquitoes from entering, like installing window screens (Fox et al., 2021).

Other Mosquito control methods

Various methods have been explored to reduce mosquito bites and slow malaria transmission. Efforts to reduce mosquito larvae by limiting access to open water or introducing substances to inhibit their development have proven effective in certain areas (Martello et al., 2022). However, electronic mosquito repellent devices, which emit high-frequency sounds intended to repel female mosquitoes, lack supporting evidence for their effectiveness. There is limited evidence suggesting that fogging might impact malaria transmission (Pryce et al., 2022). Additionally,

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larviciding, which involves manually applying chemical or microbial insecticides to water bodies with low larval distribution, may help reduce malaria transmission (Choi et al., 2019).

Medication

Several medications can help prevent or interrupt malaria in travelers to areas where the infection is common. Many of these medications are also used for treatment. In regions where Plasmodium has developed resistance to one or more drugs, three medications—mefloquine, doxycycline, or the combination of atovaquone/proguanil (Malarone)—are commonly used for prevention. Doxycycline and atovaquone/proguanil are generally better tolerated, while mefloquine is taken once a week (Shah et al., 2021). Chloroquine-sensitive malaria is rare in most regions (CDC, 2018). Mass drug administration (MDA) of antimalarial medications to an entire population can lower the risk of malaria transmission in that population. However, the effectiveness of MDA may depend on factors such as the local malaria prevalence, the combination of drug administration with other preventive measures like mosquito control, the percentage of the population treated, and the likelihood of reinfection (Shah et. al., 2021). The protective effect of antimalarial medications does not start immediately. People traveling to malaria-endemic areas typically begin taking the drugs one to two weeks before arrival and continue for four weeks after leaving. However, atovaquone/proguanil only requires starting two days before travel and continuing for seven days afterward. Preventive medications are generally not practical for people living in malaria-prone areas due to their cost, potential side effects from long-term use, and the difficulty of accessing these drugs outside wealthy countries. These drugs are usually prescribed to pregnant women and short-term visitors.

During pregnancy, malaria prevention medications have been shown to improve birth weight and reduce maternal anemia risk (Radeva-Petrova, 2018). Long-term use of preventive drugs in malaria-endemic regions may contribute to the development of partial resistance. Administering antimalarial drugs to infants through intermittent preventive therapy can lower the risk of malaria, hospital admissions, and anemia (Esu et. al., 2021). Mefloquine is more effective than sulfadoxine-pyrimethamine in preventing malaria in HIV-negative pregnant women (González et. al., 2021).

Treatment

Malaria is treated with antimalarial medications, with the choice of medication depending on the type and severity of the disease (Hanboonkunupakarn et. al., 2022). While medications for fever are commonly administered, their impact on outcomes remains unclear. Providing free antimalarial drugs to households can reduce childhood mortality when used correctly. However, programs that treat all fevers presumptively with antimalarial drugs may lead to overuse of these medications and neglect other causes of fever. The use of malaria rapid diagnostic tests can help reduce the unnecessary use of antimalarials (Mayo Clinics, 2022).

Uncomplicated Malaria

Use of antipyretics

In young children, high fevers are often accompanied by vomiting, medication regurgitation, and seizures. They are treated with antipyretics, and if necessary, fanning and tepid sponging. Antipyretics should be used if the core temperature exceeds 38.5 ºC. Paracetamol (acetaminophen) at a dose of 15 mg/kg body weight every 4 hours is commonly used; it is safe, well tolerated, and can be administered orally or as a

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suppository. Ibuprofen (5 mg/kg body weight) has also been successfully used to treat malaria and other childhood fevers, but it, along with aspirin and other non-steroidal anti-inflammatory drugs, is no longer recommended due to the risks of gastrointestinal bleeding, renal impairment, and Reye's syndrome.

Use of anti-emetics

Vomiting is common in acute malaria and can be severe. As a result, parenteral antimalarial treatment may be necessary until oral medication can be tolerated. Once tolerated, a full 3-day course of ACT should be administered. Anti-emetics can be sedative and may cause neuropsychiatric side effects, potentially masking or complicating the diagnosis of severe malaria. Therefore, they should be used with caution.

Management of seizure

Generalized seizures are more frequently observed in children with P. falciparum malaria compared to those with malaria caused by other species, indicating a potential overlap between the cerebral effects of falciparum malaria and febrile convulsions.

Since seizures may be an early sign of cerebral malaria, patients experiencing more than two seizures within a 24-hour period should be treated as if they have severe malaria. If seizures persist, airway management should be prioritized, and anticonvulsants (such as parenteral or rectal benzodiazepines or intramuscular paraldehyde) should be administered. Once the seizures stop, treatment should proceed as outlined in section 7.10.5 if the child's core temperature exceeds 38.5 ºC. There is no evidence to support the use of prophylactic anticonvulsants for uncomplicated malaria, and they are not recommended. (WHO Guidelines for malaria, 2023).

Artemisinin-based combination therapy

Children and adults with uncomplicated P. falciparum malaria should be treated with one of the following ACTs*:

Artemether-lumefantrine (AL)
Artesunate-amodiaquine (AS+AQ)
Artesunate-mefloquine (ASMQ)
Dihydroartemisinin-piperaquine (DHAP)
Artesunate + sulfadoxine-pyrimethamine (AS+SP)
Artesunate-pyronaridine (ASPY)

Severe and complicated Malaria

Severe and complicated malaria is almost always caused by P. falciparum, while other species typically lead to only febrile disease. These severe cases are medical emergencies due to high mortality rates, ranging from 10% to 50%. The recommended treatment for severe malaria involves intravenous administration of antimalarial drugs. For severe malaria, parenteral artesunate has been found to be more effective than quinine in both children and adults (CDC, 2022). Other studies show that artemisinin derivatives (artemether and artesunate) are equally or more effective than quinine for treating cerebral malaria in children (WHO, 2022). Treatment of severe malaria also includes supportive measures best provided in a critical care unit, such as managing high fevers, seizures, and monitoring for complications like poor breathing, low blood sugar, and potassium levels. Artemisinin derivatives are as effective or more effective than quinolines in reducing mortality from severe malaria. The quinine loading dose helps shorten fever duration and increases parasite clearance. No significant difference in effectiveness has been found between intrarectal quinine and intravenous or intramuscular quinine for treating uncomplicated or complicated falciparum malaria. There is limited evidence supporting the use of intramuscular artemether for severe malaria treatment.

Administering rectal artesunate before hospital transfer can reduce mortality in

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children with severe malaria. In cases of malaria with hypoglycemia in children, sublingual glucose has shown better results in raising blood sugar compared to oral glucose, based on very limited data (De Buck et. al., 2019).

Managing Cerebral Malaria

Cerebral malaria often causes the patient to become comatose. If the cause of the coma is unclear, tests should be conducted to rule out other common causes of encephalopathy, such as bacterial, viral, or fungal infections. In areas with a high prevalence of malaria (e.g., tropical regions), treatment can begin without prior testing (CDC, 2022). Once cerebral malaria is confirmed, the following management steps should be taken:

• Patients in a coma should receive careful nursing care, including monitoring vital signs, repositioning every 2 hours, and avoiding wet bedding.

• A sterile urethral catheter should be inserted to assist with urination.

• In the case of seizures, a slow intravenous dose of benzodiazepine should be administered (WHO, 2022). There is insufficient evidence to support that blood transfusion reduces mortality or improves hematocrit in children with severe anemia. Similarly, there is no strong evidence that iron chelating agents like deferoxamine and deferiprone improve outcomes for patients with P. falciparum malaria.

Resistance

Drug resistance is an increasing challenge in malaria treatment in the 21st century. In the 2000s, malaria strains with partial resistance to artemisinins emerged in Southeast Asia. Resistance is now widespread against all classes of antimalarial drugs, except artemisinins, making treatment of resistant strains increasingly reliant on this class of drugs. However, the high cost of artemisinins limits their accessibility in developing countries. Malaria strains along the Cambodia–Thailand border have developed resistance to combination therapies that include artemisinins, potentially rendering them untreatable. The prolonged exposure of parasite populations to artemisinin monotherapies in subtherapeutic doses for over 30 years, along with the availability of substandard artemisinins, likely contributed to the emergence of resistant strains. Resistance to artemisinin has been observed in Cambodia, Myanmar, Thailand, and Vietnam, with emerging resistance in Laos (Ashley, 2018). Resistance to the artemisinin-piperaquine combination was first detected in Cambodia in 2013 and had spread by 2019 to Laos, Thailand, and Vietnam, with up to 80 percent of malaria parasites resistant in some regions (Gallagher, 2019).

2.2 THEORICAL REVIEW

HEALTH PROMOTION MODEL

The **Health Promotion Model (HPM)** is a nursing theory developed by **Nola J. Pender**, a prominent nursing theorist. It is a holistic framework that focuses on promoting health and preventing illness through individual and environmental interactions.The Health Promotion Model (HPM) acknowledges that health is shaped by personal factors, behaviors, and the environment. Central to the model is the concept of self-efficacy, which refers to an individual's belief in their ability to take action and make positive health decisions. The model suggests that people are more likely to engage in health-promoting behaviors if they believe in their own capabilities.

The HPM includes several key components:

1. **Individual characteristics and experiences:** These include personal demographics, biological factors, cognitive and emotional influences, and past health experiences. These characteristics shape beliefs,

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attitudes, and perceptions about health and guide health-related behaviors.

2. **Behavior-specific cognitions and affect:** This encompasses thoughts, beliefs, and emotions related to health behaviors, such as perceived benefits, barriers, self-efficacy, activity-related feelings, and interpersonal influences. These factors significantly impact whether a person engages in health-promoting behaviors.
3. **Behavioral outcomes:** These are the results of health-promoting behaviors, which may include improved health, enhanced well-being, and a better quality of life. The model recognizes that health behaviors can have both immediate and long-term effects.
4. **Commitment to a plan of action:** This emphasizes the importance of setting goals and committing to specific actions to improve health. It highlights the role of intention and planning in starting and maintaining healthy behaviors.
5. **Environmental factors:** The model acknowledges that the physical, social, and cultural environment influences health behaviors. These factors can either support or hinder health-promoting actions and include social support, access to resources, and societal norms.

The HPM offers a thorough framework for understanding and promoting health behaviors. It can be used in various healthcare settings to guide nursing interventions aimed at health promotion, disease prevention, and health education. By considering individual characteristics, behavior-specific thoughts and emotions, environmental factors, and health behavior outcomes, nurses can develop targeted interventions to help individuals make positive health choices and improve overall well-being.

UTILIZATION OF HEALTH PROMOTION MODEL

The Health Promotion Model provides a valuable theoretical framework that can help understand and analyze the factors influencing mothers' knowledge and behaviors related to malaria prevention in this specific population.

1. **Understanding Knowledge and Behavior:** The Health Promotion Model highlights the role of individual characteristics and experiences in shaping health behaviors. It will assist in exploring how factors such as mothers' demographics, past experiences with malaria, and their cognitive and emotional influences affect their knowledge and preventive actions. The model emphasizes that knowledge is a critical driver of behavior change, and by understanding the factors that impact mothers' knowledge, targeted interventions can be developed.
2. **Behavior-Specific Cognitions:** The model focuses on behavior-specific cognitions, like perceived benefits and barriers, which influence health behaviors. This can be used to assess mothers' perceptions of the advantages of malaria prevention methods, as well as the obstacles they face in implementing these practices. Understanding these perceptions can provide insights into the motivations or challenges that affect mothers' adoption of preventive measures.
3. **Commitment to Action:** The Health Promotion Model underscores the importance of goal-setting and

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commitment to a course of action. This can help examine mothers' dedication to taking preventive steps, such as using insecticide-treated bed nets or seeking prompt medical care for their children. Evaluating their intentions and planning behaviors offers valuable insights into their readiness to engage in preventive practices.

4. **Environmental Factors:** The model recognizes how environmental factors influence health behaviors. In the context of malaria prevention, this will aid in examining how elements like access to mosquito nets, availability of healthcare services, and social support systems affect mothers' knowledge and ability to carry out preventive measures. Identifying environmental facilitators and barriers can guide interventions that address the specific challenges mother's encounter.

By applying the Health Promotion Model, a better understanding of the factors affecting mothers' knowledge and behaviors related to malaria prevention can be gained. This knowledge will inform the development of targeted interventions and educational programs aimed at enhancing mothers' knowledge, encouraging positive preventive behaviors, and ultimately reducing malaria incidence among children under five years old (Nurses'labs, 2023).

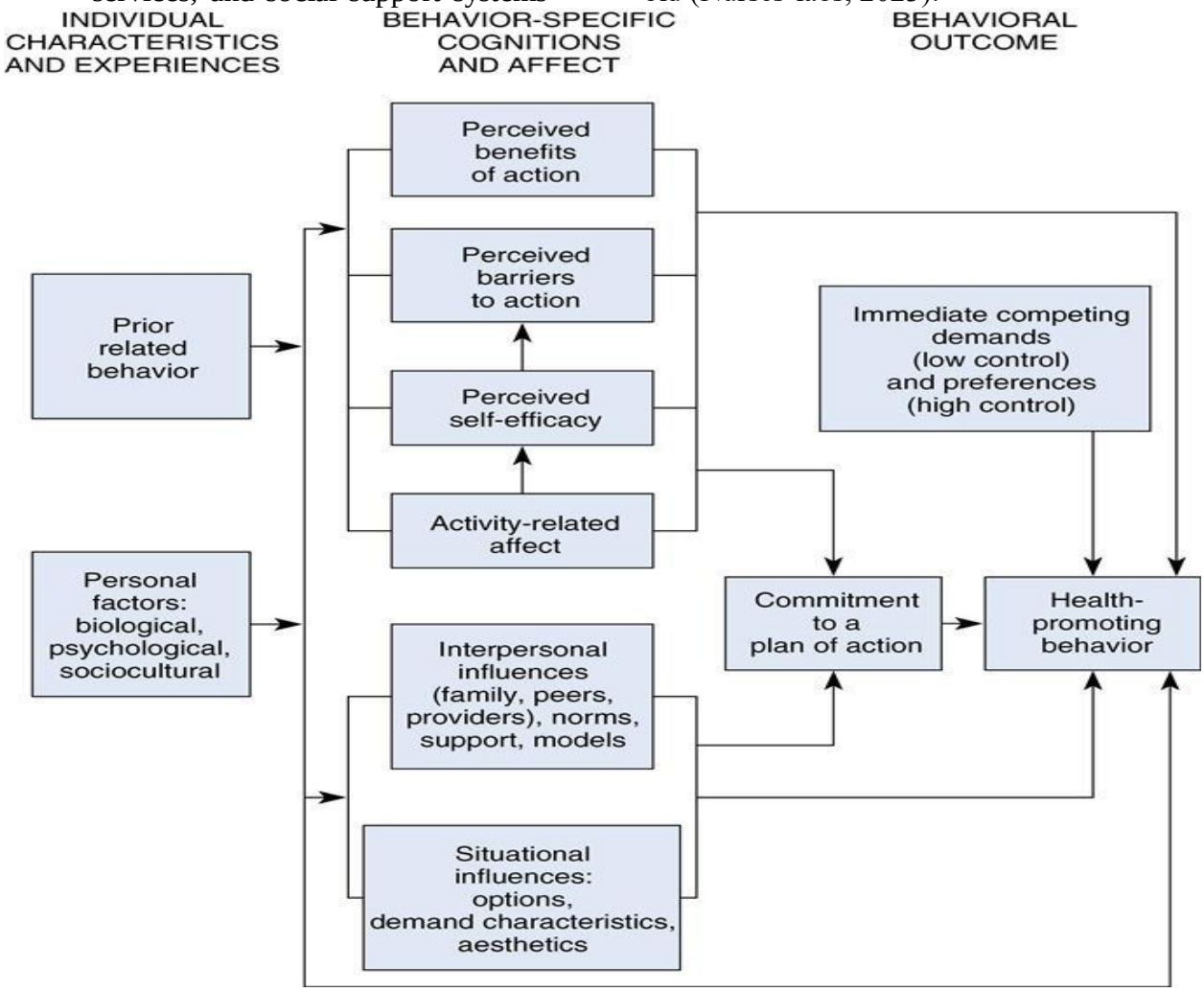

Figure 2.2 Health Promotion Model. Retrieved from Nurse Key.

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2.3 EMPIRICAL REVIEW

In a study carried out by Oluwasogo et. al., 2018, to assess the knowledge of mothers in the prevention and treatment of malaria. The study revealed that many caregivers of children under five years old lack sufficient knowledge about the cause, control, and treatment of malaria. While most parents are aware of the mosquito vector responsible for malaria transmission, they adopt preventive measures such as spraying insecticides, wearing long sleeves, using mosquito nets, installing gauze wire on windows and doors, and using mosquito coils. Treatment-seeking behavior is influenced by factors such as cost, availability, and cultural beliefs about the causes and effective treatments for malaria-like symptoms. This highlights the urgent need for interventions to promote and adopt updated malaria management strategies in rural areas. While interventions to improve home management of childhood fever are crucial, they must consider the socio-economic and cultural context of drug use. Strategies to encourage responsible and effective management should focus on increasing the knowledge of the broader population, including mothers, schoolchildren, market vendors, and shopkeepers. Additionally, there is a need for greater allocation of resources and trained health professionals in public health initiatives.The survey, conducted using questionnaires, showed that 72.09% of respondents were aged between 21 and 50 years. Only 23.26% were between the ages of 15-20, and 4.65% were between 51-60 years old. The findings indicated that only 55% (22/40) of parents/caregivers knew that female Anopheles mosquitoes are responsible for malaria transmission. However, 2.5% (1/40) believed that rats cause malaria, 7.5% (3/40) thought dogs were responsible, and 5% (2/40) believed cockroaches could transmit malaria. Additionally, 30% (12/40) of respondents were unaware of the vector responsible for malaria transmission (Oluwasogo et al., 2018).

A similar study by Kio, Agbede, and Olayinka in Ogun state, Nigeria, assessed the knowledge, attitudes, and practices of mothers with children under five in relation to malaria prevention. Although most respondents had fair knowledge about malaria transmission and symptoms, their knowledge regarding prevention and control was inadequate. Despite having good attitudes, their practices toward malaria prevention were found to be poor.Interventions aimed at social and behavioral change should focus on addressing the gaps in practices identified by the study. Based on the findings, the following issues should be considered to improve malaria prevention practices among mothers of children under five in the study area and throughout Nigeria:

1. Efforts should be directed towards enhancing respondents' knowledge of effective preventive measures for malaria. Educational interventions should address the knowledge gaps identified in the study and reinforce the health information that these women receive from healthcare clinics.
2. While it is important to increase the availability and affordability of mosquito-treated nets, with a focus on making them accessible or even free for women attending clinics, healthcare programs should also include women empowerment initiatives to help enhance their financial capacity to afford healthcare.
3. Community healthcare service providers should actively engage in educating communities on the importance of environmental sanitation as part of their services (Kio et. al., 2018).

A study conducted by Paul, Maduka, and Chijioke-Nwauche examined malaria preventive practices among children under

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five in Rivers State, Nigeria. The study involved 1,138 children, including 613 (53.9%) males and 525 (46.1%) females, with a male-to-female ratio of 1.2:1. The average age of the participants was 1.74±1.08 years. The majority of the informants were mothers, making up 1,012 (88.9%) of the respondents. Most of the informants had a tertiary education, with 605 (53.4%) of mothers and 697 (61.8%) of fathers holding such qualifications. In terms of fathers' occupations, public servants, civil servants, and self-employed individuals were the most represented, accounting for 242 (21.4%), 200 (17.7%), and 149 (13.2%) respectively. For mothers, the occupations most represented were traders/businesswomen, the self-employed, and civil servants, comprising 444 (39.7%), 181 (16.2%), and 137 (12.3%) respectively. Malaria prevention practices included the use of insecticide-treated bed nets (ITNs) by 605 (53.2%) respondents, indoor spraying of insecticide (modified IRS) by 483 (42.4%), use of antimalarial drugs by 133 (11.7%), clearing of bushes or disposal of breeding containers by 4 (0.4%), and the use of mosquito repellent creams by 2 (0.2%). Of the children, 512 (45.0%) slept under ITNs the previous night, and 970 (85.2%) had window nets installed in their homes.Protective window nets were installed in the homes of 970 (85.2%) of the study participants. Among those using insecticide-treated nets (ITNs), 110 (61.8%) were from the middle social class, and 62 (34.8%) were from the upper social class. Similarly, 316 (52.2%) and 276 (45.6%) of participants who practiced indoor spraying of insecticide (IRS) were from the upper and middle social classes, respectively. In conclusion, the most common malaria preventive practices among under-fives in Rivers State were the use of ITNs, modified IRS, and antimalarial drugs. These practices were more prevalent among families from the middle and upper social classes. Efforts should be made to increase education on integrated malaria prevention, emphasizing a comprehensive approach that combines multiple preventive measures. (Paul et. al., 2018)

A study conducted by Khadra Cisman Xasan and Saynab Maxamed Maxamud assessed the prevalence, prevention, and attitudes towards malaria among patients attending Manhal Hospital in Erigavo, Somaliland. The study found that while there is some knowledge about malaria transmission and prevention, misconceptions still exist. Those with limited knowledge of malaria tended to have poor treatment-seeking behavior. Somaliland faces significant challenges in addressing malaria, particularly due to a lack of financial and human resources, which affects the provision of adequate healthcare coverage for the entire population. Additionally, inequalities in wealth exacerbate the problem, and these challenges are difficult to overcome without substantial socioeconomic progress and social restructuring in Somaliland.The current international and national guidelines provide Somaliland with effective tools to combat malaria.

Although Somaliland has not fully implemented all aspects of the international guidelines, the measures it has put in place have had positive impacts on public health and have been crucial in reducing the disease burden. Continuing to follow these guidelines is essential for future success in malaria control. Among the various challenges, spreading information and increasing knowledge about malaria is considered one of the most important. Raising awareness among the at-risk population about the risks, preventive measures, and available treatments is likely a cost-effective way to promote better adherence to the guidelines. (Khadra et. al., 2019).

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In a study on home management of malaria by mothers at Babcock University, Okangba (2019) found that the mothers had a strong understanding and awareness of how to manage malaria in their children. These practices included taking preventive measures against mosquitoes, recognizing malaria symptoms, engaging in appropriate health-seeking behaviors, using standard antimalarial treatments, and ensuring adherence to prescribed medications. It can be concluded that the home management of malaria by these mothers is effective, largely due to their high level of education and good health-seeking behaviors. The effectiveness of these practices in reducing malaria incidence is supported by statistical analysis, showing that the mothers' knowledge and exposure to malaria management contribute to better outcomes. (Okangba et. al., 2019). The study by Oladimeji et. al. (2019) revealed that while pregnant women and mothers of young children are aware of malaria, they still lack a comprehensive understanding of the disease. Many mothers recognize key malaria symptoms such as fever, chills, and headache, but there are also misconceptions about the disease that need to be addressed through intensified education. This education should specifically target mothers who are either pregnant or caring for young children, as they are more vulnerable to malaria. Education, as a sociodemographic factor, plays a crucial role in improving malaria knowledge among mothers, and therefore, government policies should focus on enhancing the educational status of citizens to reduce the disease burden, particularly among vulnerable groups. Mothers should be educated on the importance of improved health-seeking behaviors and awareness of their health status. Nigeria's malaria strategic plan must focus on bridging the knowledge gap related to malaria prevention and treatment. This approach will guide policymakers in implementing continuous strategic interventions, including health awareness and educational programs, to achieve the 2030 malaria targets. (Oladimeji et. al., 2019).

CHAPTER THREE
METHODOLOGY

3.1 DESIGN
The research design is a cross-sectional quantitative study aimed at assessing mother's knowledge and attitude on prevention of malaria among under (5) years children in selected Primary health centers in Ayobo, Lagos.

3.2 RESEARCH SETTING
The study was carried out in selected primary health centers in Lagos which are Government-owned Primary Health Care Centers. The core values of these Primary health centers are to implement Lagos State Primary Health Care, through community participation, intersectoral collaboration, utilization of appropriate technology and development of human resources for health integrated service, provision, and supply of essential drugs and comprehensive monitoring and evaluation.

3.3 TARGET POPULATION
The target populations are mothers of children under 5 years utilizing the service of the selected Primary Health Care Centers.

3.4 SAMPLING (SIZE AND FORMULA)
The Cochran's formula was used to calculate the sample size.
Formula for sample size is $n = \frac{Z^2pq}{d^2}$

$$n = \frac{Z^2pq}{d^2}$$

where;
n= Desired Sample Size

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Z= Statistical significance @95% confidence interval= 1.96
P= prevalence of condition in the study = 0.5
q= 1-p = 1- 0.5 = 0.5

$$\text{sample size} = \frac{(1.96)^2(0.5)(0.5)}{(0.05)}$$

$$= \frac{3.8416 \times 0.25}{0.0025}$$

$$= \frac{0.9604}{0.0025}$$

$$= 384.16$$

$$= 384$$

Since the target population is less than 10,000, the cochran's formula was modified to get the minimum sample size; thus:

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

Where; nf = desired sample for population <10,000
n = desired sample size
N = estimate of the population size (100)

$$n = 384$$

$$nf = \frac{384}{1 + \frac{384}{100}}$$

$$nf = \frac{384}{1+3.84}$$

$$nf = 79.3 = 79$$

To compensate for opt-out, improperly filled and unreturned questionnaire, 10% of the desired sample size was added to the calculated sample size.

$$\text{Attrition} = \frac{10}{100} * 79$$

$$= 7.9$$

Sample size estimate = nf + attrition
= 79 + 7.9 = 86.9 = 87
Ns (sample size adjusted for response rate) = 87

3.5 SAMPLING TECHNIQUE

The sample for this study consists of 87 mothers of children under 5 years, selected for this study. A cross-sectional technique was used for this study, with questionnaires administered to the mothers.

3.6 INSTRUMENT FOR DATA COLLECTION

Data was collected using questionnaire as instruments.

3.7 VALIDITY OF INSTRUMENT

The face and content validity of the structured questionnaires was considered by the researcher by matching its item with the set objectives, research questions, and literature review and formulated assumptions. A copy of the instrument was reviewed by research expert for intellectual review, critiquing and useful corrections and suggestions.

3.8 RELIABILITY OF INSTRUMENT

Reliability is the ability of instrument/tool to consistently measure what it is designed to measures. This will enable the researcher identify the strength and weakness of the questionnaire and necessary corrections will be made. 87 copies of structured questionnaire were administered to mothers of children under 5 years to subject of similar characteristic with the study using reliability coefficient. The administration of questionnaire was span for 2 weeks, adequate information was provided for the respondent on how to fill the questionnaire.

3.9 METHOD OF DATA COLLECTION

Permission was obtained from the head of the selected PHC centres. The self-administered structured questionnaires were distributed among mothers attending the selected primary health centers. Details of the study was explained to the respondents and their consent was sought before they

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participate and all questionnaires were retrieved back immediately.

3.10 METHOD OF DATA ANALYSIS

Data was analyzed using statistical package for social science (SPSS) and was presented in frequency, percentages, means and standard deviation with the aid of charts and tables.

3.11 ETHICAL CONSIDERATION

Permission was sought from the Lagos State college of nursing Ethical committee before commencing this study. Oral and written informed consent was obtained from the respondents prior to the participation in the study, confidentiality was strictly maintained. The respondents were also informed of their right to withdraw at any point of the study without any harm.

CHAPTER FOUR
RESULTS

4.1 INTRODUCTION

This chapter presents the analysis of the data collected for this research work with the aid of Statistical Package for Social Sciences (SPSS) version 25 and Microsoft Office Excel version 2010. The descriptive statistics used in this part of the study presented and analyzed the data using frequencies, percentages, and graphical representation(s) of bar chart(s). A self-developed questionnaire consisting of thirty-three (33) item questions was distributed to the sample population of eighty-seven (87) caregivers, but a valid return rate of 96.6% (84) analyzed was presented below.The following are the frequency and percentage tables, and bar chart(s) used in the research work, including the analysis used to answer the research questions:

Table 1:Socio-Demographic data

Socio-demographic Characteristics	**Frequency**	**Percentage (%)**
Age group (in years)		
21-25	16	19.1
26-30	28	33.3
31-35	18	21.4
36-40	14	16.7
Above 40	8	9.5
Total	**84**	**100.0**
Sex		
Male	14	16.7
Female	70	83.3
Total	**84**	**100.0**
Religion		
Christian	54	64.3
Muslim	30	35.7
Others	--	--
Total	**84**	**100.0**
Relationship with child		
Mother	71	84.5
Father	6	7.1
Aunt	3	3.6
Uncle	--	--
Others (Grandmother)	4	4.8

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Total	**84**	**100.0**
Number of under-five children		
One	34	40.5
Two	28	33.3
Three	22	26.2
Total	**84**	**100.0**
Number of other children		
One	44	52.4
Two	28	33.3
Three	12	14.3
Total	**84**	**100.0**
Area of residence		
Urban	60	71.4
Rural	24	28.6
Total	**84**	**100.0**
Marital status		
Married	74	88.1
Single	6	7.1
Separated	2	2.4
Divorced	2	2.4
Consensual union (living together)	--	--
Widow/Widower	--	--
Total	**84**	**100.0**
Educational level		
None	--	--
Primary	5	6.0
Secondary	28	33.3
Tertiary	40	47.6
Vocational skills	11	13.1
Total	**84**	**100.0**
Occupational status		
Government-sector employed	14	16.7
Private-sector employed	10	11.9
Self-employed	50	59.5
Unemployed	4	4.8
Student	6	7.1
Retired	--	--
Total	**84**	**100.0**

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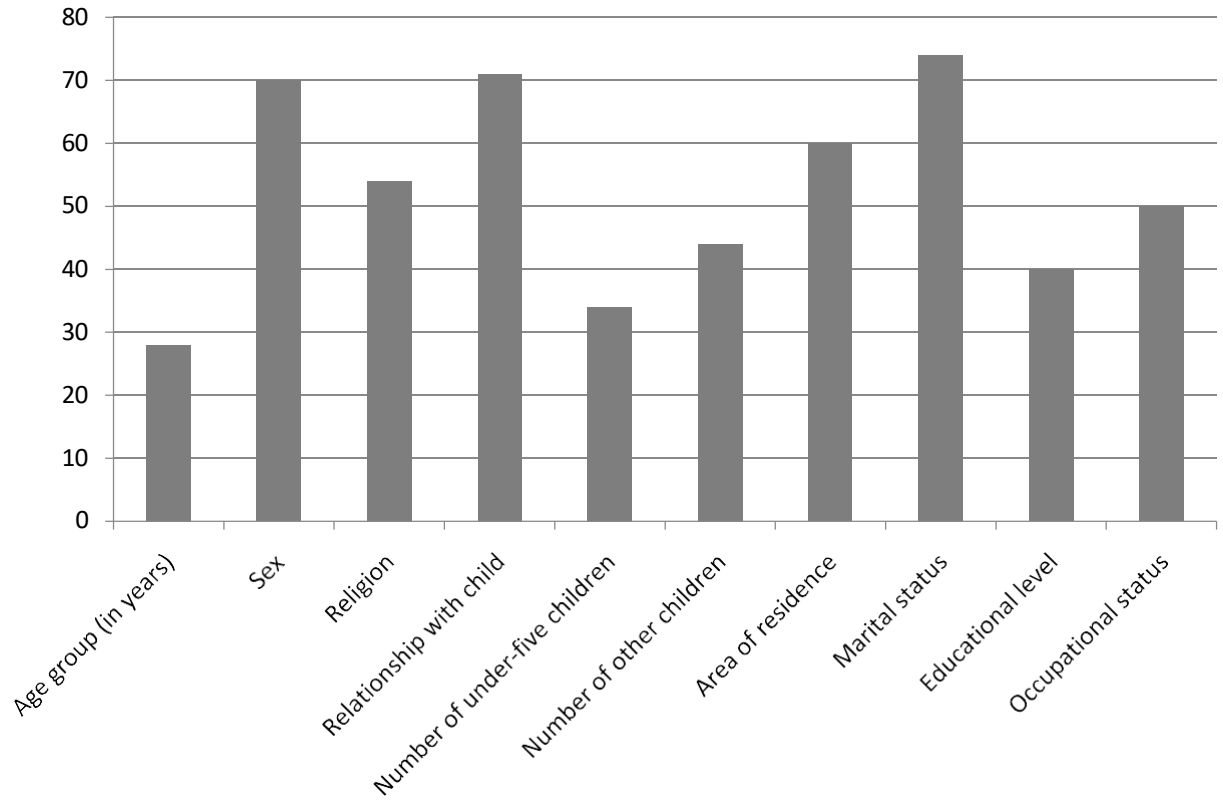

Figure 1: Socio-Demographic data

From Table 1 and Figure 1, it is evident that a significant proportion (33.3%) of the participants fall within the age range of 26–30 years. The majority (83.3%) are female, with the study population predominantly identifying as Christians (64.3%). Most participants (84.5%) are mothers, and a notable percentage (40.5%) have a child under five years of age, while more than half (52.4%) have children older than five. The majority (71.4%) reside in urban areas, with most (88.1%) being married. Nearly half (47.6%) of the participants have attained a tertiary level of education, and more than half (59.5%) are self-employed.

Table 2: Respondents' Under-five Children Demographics

Demographic Characteristics	**Frequency**	**Percentage (%)**
Child's sex		
Male	72	52.9
Female	64	47.1
Total	**136**	**100.0**
Child's age		
≤ 1 month – 6 months	40	29.4
7 months – 11 months	12	8.8
12 months – 18 months	12	8.8
Above 18 months – 3 years	47	34.6
Above 3 years	25	18.4
Total	**136**	**100.0**

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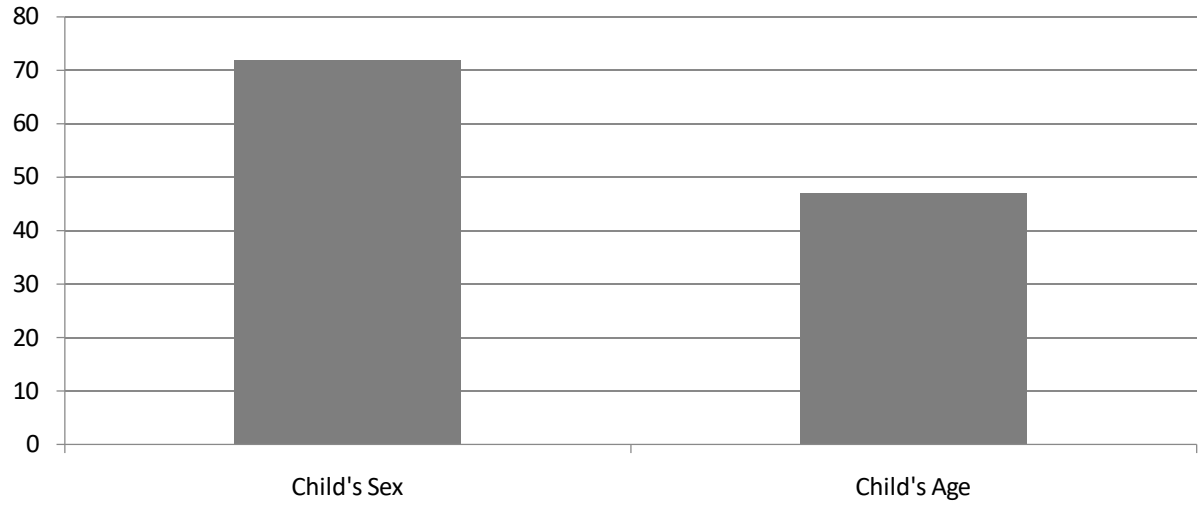

Figure 2: Respondents' Under-five Children Demographics

From Table 2 and Figure 2, the data shows that over half (52.9%) of the respondents' under-five children are male, with a significant proportion (34.6%) being aged between 18 months and 3 years.

Table 3: Respondents' Knowledge about Malaria

Item Question(s)	**Scale/Options /Responses**	**Frequency**	**Percentage (%)**
Have you ever heard of malaria?	Yes No	80 4	95.2 4.8
	Total	**84**	**100.0**
	Mean (x)	1.9	
	Remark	Good	
Source of information about malaria.	- Television. - Printed materials (billboards/handbills /magazines/newspapers). - Internet/social media. - Radio. - Health workers/facilities. - Television and radio. - Television and health workers/facilities. - Internet/social media and radio. - Internet/social media and health workers/facilities. - Television, internet/social media and radio. - Television, internet/social	6 4 6 5 6 4 6 2 6 4 4	7.1 4.8 7.1 6.0 7.1 4.8 7.1 2.4 7.1 4.8 4.8

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	media, radio and printed material. - Television, radio, health workers/facilities and printed material. - Television, internet/social media, radio and health workers/facilities. - Television, internet/social media, radio, health workers/facilities and printed material. - Others.	 4 6 21 --	 4.8 7.1 25.0 --
	Total	**84**	**100.0**
What causes malaria?	- Parasite through mosquito bites. - Eating too much. - Close contact with a person who has malaria. - Don't know. - Others.	78 -- 6 -- --	92.9 -- 7.1 -- --
	Total	**84**	**100.0**
	Mean (x)	1.9	
	Remark	Good	
Resting and breeding places of mosquitoes.	- Stagnant water. - Bushes/dirty places. - Stagnant water and bushes/dirty places. - Stagnant water, bushes/dirty places, and dark places/sheds. - Don't know. - Others.	16 12 30 22 4 --	19.0 14.3 35.7 26.2 4.8 --
	Total	**84**	**100.0**
What signs and symptoms of malaria are you aware of?	- Fever. - Headache. - Fever and headache. - Fever, headache and loss of appetite. - Fever, vomiting and loss of appetite. - Fever, headache, and body and joint pains. - Headache, vomiting and loss of appetite. - Headache, body and joint	2 2 5 4 2 4 4 5	2.4 2.4 6.0 4.8 2.4 4.8 4.8 6.0

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	pains, and vomiting. - Fever, headache, vomiting, and loss of appetite. - Fever, headache, body and joint pains, and vomiting. - Fever, headache, body and joint pains, and loss of appetite. - Headache, body and joint pains, vomiting, and loss of appetite. - Fever, headache, body and joint pains, vomiting, and loss of appetite. - Don't know. - Others.	 5 5 5 4 37 -- --	 6.0 6.0 6.0 4.8 44.0 -- --
	Total	**84**	**100.0**
Can malaria be prevented?	Yes No Don't know	56 18 10	66.7 21.4 11.9
	Total	**84**	**100.0**
	Mean (x)	1.4	
	Remark	Good	
Can malaria be cured?	Yes No Don't know	76 -- 8	90.5 -- 9.5
	Total	**84**	**100.0**
	Mean (x)	1.8	
	Remark	Good	
Cam malaria lead to death?	Yes No Don't know	54 16 14	64.3 19.0 16.7
	Total	**84**	**100.0**
	Mean (x)	1.3	
	Remark	Good	
	Average mean score	**1.6**	**Good**

Note: Criteria for scoring:
Mean score between 0.0-0.9 is rated poor; while 1.0-1.9 is rated good.

According to Table 3, the majority (95.2%) of participants reported being aware of malaria. Most respondents (92.9%) recognized that malaria is caused by a parasite transmitted through mosquito bites, and 90.5% affirmed that malaria is curable. A majority (66.7%) believed malaria could be prevented, while 64.3% acknowledged that it can lead to death. Nearly half (44.0%) identified fever, headache, body and joint pains, vomiting, and loss of appetite as known signs and symptoms of malaria. Additionally, 35.7% identified stagnant water and bushy or unclean areas as mosquito breeding and resting sites. About 25.0% cited television, internet/social media,

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radio, health workers, or printed materials (such as billboards, handbills, magazines, and newspapers) as their sources of malaria information.Overall, the participants demonstrated a good level of malaria knowledge, with an average mean score of 1.6.

Table 4: Respondents' Attitude towards Prevention of Malaria

Item Question(s)	**Scale/Options /Responses**	**Frequency**	**Percentage (%)**
Do you think malaria is a very serious health problem?	Yes No Not sure Don't know	56 18 8 2	66.7 21.4 9.5 2.4
	Total	**84**	**100.0**
	Mean (x)	1.4	
	Remark	Positive	
Do you and your child(ren) sleep under a bed net?	Yes No	40 44	47.6 52.4
	Total	**84**	**100.0**
	Mean (x)	1.0	
	Remark	Positive	
If "yes", is the bed net:	Treated Not treated Don't know	22 8 10	55.0 20.0 25.0
	Total	**40**	**100.0**
	Mean (x)	1.1	
	Remark	Positive	
How often do you and your child(ren) use the bed net?	Always Sometimes Never	24 16 --	60.0 40.0 --
	Total	**40**	**100.0**
	Mean (x)	1.2	
	Remark	Positive	
If "no", why?	- I cannot afford it. - It is not readily available. - My children and I don't like sleeping under a bed net. - I don't think it is important. - Others (The heat it causes).	4 12 16 10 2	9.1 27.3 36.4 22.7 4.5
	Total	**44**	**100.0**
	Mean (x)	0.6	
	Remark	Negative	
At what time of the day	Day time	10	11.9

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do you think mosquitoes bite the most?	Night time Any time Don't know Others	48 26 -- --	57.1 31.0 -- --
	Total	**84**	**100.0**
What do you think is the best treatment for malaria?	- ACTs. - Paracetamol. - Traditional/herbal medications. - ACTs and traditional/herbal medications. - ACTs, paracetamol, and traditional/herbal medications. - Don't know. - Others.	56 -- 8 4 6 10 --	66.7 -- 9.5 4.8 7.1 11.9 --
	Total	**84**	**100.0**
	Mean (x)	1.4	
	Remark	Positive	
	Average mean score	**1.1**	**Positive**

Note: Criteria for scoring:
Mean score between 0.0-0.9 is rated negative; while 1.0-1.9 is rated positive.

According to Table 4, the majority (66.7%) of respondents recognized malaria as a very serious health issue and identified ACTs as the most effective treatment. Over half (57.1%) acknowledged that mosquito bites are most frequent at night. Nearly half (47.6%) reported that they and their children sleep under a bed net, with 60.0% confirming consistent use of the net. More than half (55.0%) stated that the bed nets they use are treated. Among those who do not sleep under a bed net, a notable proportion (36.4%) mentioned a dislike for using bed nets as the reason.Overall, the participants demonstrated a positive attitude toward malaria prevention, with an average mean score of 1.1.

Table 5: Respondents' Practice of Malaria Prevention

Item Question(s)	**Scale/Options /Responses**	**Frequency**	**Percentage (%)**
What measures do you take to protect you and your child(ren) from mosquito bites?	- Insecticide spray. - Mosquito repellant. - Clearing bushes around the house. - Sleeping under insecticide-treated bed net. - Insecticide spray and mosquito repellant. - Insecticide spray and getting rid of stagnant water. - Insecticide spray and clearing bushes around the house.	6 2 2 2 6 6 2	7.1 2.4 2.4 2.4 7.1 7.1 2.4

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	- Insecticide spray and regular clean-ups around the house.	2	2.4
	- Insecticide spray, clearing bushes around the house, and getting rid of stagnant water.	2	2.4
	- Insecticide spray, clearing bushes around the house, and regular clean-ups around the house.	2	2.4
	- Insecticide spray, getting rid of stagnant water, and sleeping under insecticide-treated bed net.	2	2.4
	- Insecticide spray, clearing bushes around the house, and regular clean-ups around the house.	2	2.4
	- Insecticide spray, clearing bushes around the house, getting rid of stagnant water, and sleeping under insecticide-treated bed net.	2	2.4
	- Insecticide spray, clearing bushes around the house, getting rid of stagnant water, and regular clean-ups around the house.	2	2.4
	- Insecticide spray, mosquito repellant, clearing bushes around the house, and regular clean-ups around the house.	2	2.4
	- Insecticide spray, mosquito repellant, clearing bushes around the house, and getting rid of stagnant water.	2	2.4
	- Insecticide spray, mosquito repellant, clearing bushes around the house, getting rid of stagnant water, and regular clean-ups around the house.	10	11.9
	- Insecticide spray, clearing bushes around the house, getting rid of stagnant water, sleeping under insecticide-treated bed net, and regular clean-ups around the house.	6	7.1
	- Insecticide spray, mosquito repellant, getting rid of stagnant water, sleeping under insecticide-treated bed net, and regular clean-ups around the house.	6	7.1

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	- Insecticide spray, mosquito repellant, clearing bushes around the house, getting rid of stagnant water, sleeping under insecticide-treated bed net, and regular clean-ups around the house. - Insecticide spray, mosquito repellant, wearing protective clothing, clearing bushes around the house, getting rid of stagnant water, sleeping under insecticide-treated bed net, and regular clean-ups around the house.	12 6	14.3 7.1
	Total	**84**	**100.0**
	Mean (x)	0.3	
	Remark	Poor	
What is the first thing you do when your child(ren) has/have a fever?	- Go to clinic/hospital. - Go to pharmacy. - Home treatment/self-medication. - Do nothing. - Others (Consult a registered nurse).	32 17 30 -- 5	38.1 20.2 35.7 -- 6.0
	Total	**84**	**100.0**
	Mean (x)	0.8	
	Remark	Poor	
What determines/influences your action to seek care if your child(ren) has/have a fever?	- Condition of the child. - Cost involved. - Time availability. - Condition of the child and time availability. - Condition of the child, cost involved, and time availability. - Others (Close relative's opinion).	60 6 8 4 4 2	71.4 7.1 9.5 4.8 4.8 2.4
	Total	**84**	**100.0**
	Mean (x)	1.4	
	Remark	Good	
What do you do when an antimalarial medication is prescribed for your sick child(ren)?	- Administer the full treatment course. - Stop administration as soon as child begins to show improvement. - Administer to other siblings who are sick or not sick with malaria. - Others.	64 20 -- --	76.2 23.8 -- --
	Total	**84**	**100.0**
	Mean (x)	1.5	

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	Remark	Good	
How long do you wait before seeking medical help if your child has a fever?	- Within 24 hours. - 2-5 days. - More than 7 days. - Not sure. - Others (Nurse's or doctor's advice). (Health centre opening time). (Depends on how serious the fever is).	32 40 -- 6 2 2 2	38.1 47.6 -- 7.1 2.4 2.4 2.4
	Total	**84**	**100.0**
	Mean (x)	0.8	
	Remark	Poor	
	Overall mean score	**1.0**	**Good**

Note: Criteria for scoring:
Mean score between 0.0-0.9 is rated poor; while 1.0-1.9 is rated good.

As shown in Table 5, the majority (76.2%) of participants reported completing the full course of antimalarial treatment when prescribed for their sick child(ren). Most (71.4%) indicated that the child's condition influences their decision to seek care if their child(ren) has/have a fever. A significant number (38.1%) stated that they seek medical help within 24 hours and visit a clinic or hospital when their child(ren) has/have a fever. However, only 14.3% identified measures such as using insecticide spray, mosquito repellents, clearing bushes, eliminating stagnant water, sleeping under insecticide-treated bed nets, and maintaining regular clean-ups around the house as actions taken to protect themselves and their child(ren) from mosquito bites.

Overall, the participants demonstrated a good level of malaria prevention practices, with an average mean score of 1.0.

4.2ANSWERING RESEARCH QUESTIONS

Research Question 1: What knowledge about malaria in under-five children do mothers possess?

From Table 3, the majority (95.2%) of respondents indicated awareness of malaria, with most (92.9%) acknowledging that malaria is caused by parasites transmitted through mosquito bites. A significant proportion (90.5%) affirmed that malaria is curable, 66.7% agreed that it can be prevented, and 64.3% recognized that malaria can result in death. Additionally, 44.0% identified fever, headache, body and joint pain, vomiting, and loss of appetite as known symptoms of malaria, while 35.7% highlighted stagnant water and bushes or dirty areas as common mosquito breeding and resting places.

Research Question 2: What are mothers' demographic and socio-cultural factors which may influence their knowledge, attitudes and practices regarding malaria in under-five children?

As shown in Table 1 and Figure 1, a significant portion (33.3%) of participants are aged 26–30 years. The majority (64.3%) identify as Christians, 40.5% have at least one child under five, and 52.4% have children older than five. Most participants (71.4%) reside in urban areas, 88.1% are married, 47.6% possess tertiary education, and 59.5% are self-employed.

Research Question 3: What are the practices (treatment-seeking behaviours) of mothers relating to malaria in children under five years of age?

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As presented in Table 5, the majority (76.2%) of respondents indicated that they complete the full course of antimalarial medication when prescribed for their child(ren). Most (71.4%) stated that their child's condition influences their decision to seek care when the child has a fever. Additionally, 38.1% reported seeking medical help within 24 hours and visiting a clinic or hospital if their child has a fever. Only 14.3% identified using insecticide sprays, mosquito repellents, clearing bushes, eliminating stagnant water, sleeping under insecticide-treated bed nets, and regular clean-ups as measures to protect themselves and their child(ren) from mosquito bites.

4.3 HYPOTHESIS TEST

Table 6: Testing of Research Hypothesis

	Knowledge about Malaria					
Attitude towards Prevention of Malaria	Can malaria be prevented?					
Do you and your child(ren) sleep under a bed net?	Yes	No	x^2	**df**	**p-value**	**Total**
Yes	22	18				40(47.6%)
No	34	10				44(52.4%)
Total	56 (66.7%)	28 (33.3%)	4.684	1	0.030445	**84 (100.0%)**

Chi-square value=4.684; df=1; p-value is 0.030445. The result is significant at p < .05

Conclusion: There is a significant relationship between the mothers' knowledge and attitude towards prevention of malaria among under-five children ($p < .05$).

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This chapter discusses the findings of the study, and relates them with the relevant works of other researchers. It also includes the implication of the study to nursing practice, summary, conclusion, recommendations and suggestions for further studies.

H_0: There is no significant relationship between the mothers' knowledge and attitude towards prevention of malaria among under-five children.

H_1: There is a significant relationship between the mothers' knowledge and attitude towards prevention of malaria among under-five children.

Analysis Plan: Level of significance (S.I.) = .05

Decision Rule: If the p-value of the correlation coefficient is less than .05, it is concluded that there is a significant relationship between the two variables; but if it is more than .05, then there is no significant relationship.

5.1 DISCUSSION OF FINDINGS

Malaria remains a major public health issue in Nigeria, characterized by high prevalence and incidence rates nationwide. It is a leading cause of illness and death, particularly among vulnerable groups such as pregnant women and young children. As primary caregivers, mothers play a pivotal role in identifying malaria symptoms, seeking timely treatment, and implementing preventive measures for their families. This study assessed mothers' knowledge and attitudes regarding malaria prevention among children under five years old in

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selected primary health centers in Lagos State.

The findings revealed that a significant portion (33.3%) of the participants were aged 26–30 years, with the majority (83.3%) being female. Christians constituted the predominant religious group (64.3%). Most participants (84.5%) were mothers, with 40.5% having a child under five and 52.4% having a child over five years old. Urban residents accounted for 71.4% of the participants, 88.1% were married, and 47.6% held tertiary education qualifications. Additionally, 59.5% of the respondents were self-employed. Among the under-five children, 52.9% were male, and 34.6% were aged between 18 months and 3 years.In terms of knowledge about malaria in children under five, the study revealed an overall good level of awareness. The vast majority (95.2%) had heard of malaria, with 92.9% identifying mosquito-borne parasites as the cause.

Most participants (90.5%) believed malaria could be cured, 66.7% acknowledged that it could be prevented, and 64.3% recognized its potential to cause death. Additionally, 44.0% were aware of symptoms such as fever, headache, body and joint pain, vomiting, and loss of appetite, while 35.7% identified stagnant water and unclean environments as mosquito breeding sites.

The findings of this study differ from those of a study by Oluwasogo et. al., (2018), where many respondents lacked sufficient knowledge about the cause, control, and treatment of malaria, with 30% unaware of the vector responsible for malaria transmission. Similarly, the results of Kio et. al., (2018) contrast with this study, as although most respondents had a basic understanding of malaria transmission and symptoms, their knowledge of prevention and control was limited. Additionally, the findings of Khadra et. al., (2019) do not align with this study, as there were misconceptions about malaria transmission and poor knowledge among participants. In contrast, the results of Okangba (2019) are similar to this study, with the majority of respondents demonstrating good knowledge of the disease. The findings of Oladimeji et. al., (2019) also correspond with this study, as most participants were aware of key symptoms of malaria, such as fever, chills, and headache.

Regarding attitudes towards malaria prevention in children under five, the study revealed an overall positive attitude. A majority (66.7%) recognized malaria as a serious health issue, and acknowledged that ACTs are the most effective treatment. Additionally, 47.6% reported that they and their children sleep under bed nets, with 60.0% stating they always use the nets, and 55.0% confirming that the nets are treated. These findings align with those of Kio et. al., (2018), where respondents displayed a positive attitude towards malaria prevention. However, the findings of Khadra et. al., (2019) differ from this study, as their respondents demonstrated poor attitudes, particularly in relation to treatment-seeking behavior

The assessment of malaria prevention practices among the respondents showed a generally good level of practice. Most (76.2%) administer the full course of antimalarial medication when prescribed for their sick child(ren), and 71.4% indicated that the child's condition influences their decision to seek medical care when the child has a fever. Additionally, 38.1% seek medical help within 24 hours and visit a clinic or hospital if their child(ren) develop a fever. However, only 14.3% reported using preventive measures such as insecticide sprays, mosquito repellents, clearing bushes, removing stagnant water, sleeping under insecticide-treated bed nets, and regular cleaning around the house to protect themselves and their children from mosquito

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bites. These findings contradict those of a study by Oluwasogo et. al., (2018), where respondents used preventive methods like insecticide spraying, wearing long-sleeved clothes, using mosquito nets, installing gauze wire in windows and doors, and using mosquito coils. The treatment-seeking behavior in that study was influenced by factors such as cost, availability, and cultural beliefs about the causes and treatments of malaria-like symptoms. Similarly, Kio et. al., (2018) found that, despite having fair knowledge and good attitudes, respondents showed poor practices toward malaria prevention, which does not align with this study. On the other hand, the findings of Paul et. al., (2018) were similar to those of this study, as respondents reported malaria preventive practices such as using insecticide-treated bed nets (53.2%), indoor spraying of insecticide (42.4%), using antimalarial drugs (11.7%), clearing bushes or disposing of containers where mosquitoes breed (0.4%), and using mosquito repellent creams (0.2%).

The assessment of factors affecting malaria prevention revealed that most respondents (88.1%) are married, 71.4% live in urban areas, 64.3% are Christians, and 59.5% are self-employed. Additionally, 52.4% have a child who is not under five years of age, 47.6% have a tertiary education, 40.5% have a child under five, and 33.3% are aged between 26-30 years.

This contrasts with the findings of a study by Paul et. al., (2018), where most participants had a tertiary education and 39.7% were traders/businesswomen. However, the results of Okangba (2019) align with this study, as the respondents were well-educated, which contributed to their good knowledge of the disease and effective health-seeking behaviors in addressing malaria in their children. Similarly, the findings of Oladimeji et. al., (2019) are consistent with this study, as education was identified as a key socio-demographic factor that predicted malaria knowledge among the respondents.

5.2 IMPLICATION OF FINDINGS TO NURSING PROFESSION

The findings of this study highlight mothers' knowledge and attitudes regarding the prevention of malaria in children under five. To ensure sustained improvement in their malaria prevention practices, it is essential to assess and enhance their knowledge and attitudes. This can be achieved by organizing community-based workshops and seminars by health agencies, non-governmental organizations, government bodies, and healthcare facilities, focusing on malaria prevention, symptoms, and treatment. Public health campaigns, using posters, pamphlets, and local media, should be launched by the government and relevant agencies to provide clear and accessible information on malaria prevention.

Healthcare providers can create visual aids such as charts, posters, and videos to emphasize the importance of using bed nets, seeking early treatment, and eliminating mosquito breeding sites. These educational materials should be tailored to the cultural beliefs and practices of the community to improve receptivity. Healthcare providers should educate mothers on recognizing malaria symptoms in their children and stress the importance of timely medical intervention. Collaboration with community leaders, religious leaders, and other influential figures is crucial to promoting malaria prevention and supporting educational initiatives.

Training community health workers to conduct home visits and offer personalized education on malaria prevention will further enhance community engagement. Additionally, healthcare professionals should facilitate peer support groups where mothers can exchange experiences, learn

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from one another, and encourage each other to prioritize malaria prevention. Highlighting local success stories of mothers who effectively implement malaria prevention measures can serve as positive role models. Small incentives or rewards can also motivate mothers and families who actively engage in malaria prevention activities or attend educational sessions.

Community health workers, especially school nurses, should incorporate malaria prevention education in schools, encouraging students to share knowledge and practices with their families. Child-friendly workshops can also be organized to educate children about malaria prevention, empowering them to influence their families. Local theatre groups can be employed by government and health agencies to perform culturally relevant dramas and skits on malaria prevention and treatment.

Organizing community clean-up days to eliminate mosquito breeding sites, in collaboration with community heads, will engage mothers and families in the effort. Healthcare providers and community health workers should work together to ensure a coordinated approach to malaria prevention and treatment. Regular follow-up and support systems in healthcare facilities will help sustain malaria prevention practices. Continuous evaluation of educational initiatives will enable healthcare management to adjust strategies based on feedback and outcomes. Additionally, healthcare agencies could develop mobile apps offering accessible information on malaria prevention, including bed net use, symptom recognition, and treatment options

5.3 LIMITATIONS OF THE STUDY

The study could not be extended to other primary healthcare centers in Lagos State to compare mothers' knowledge and attitude on prevention of malaria among under-five children over there, due to time constraint and limited financial capability.

5.4 SUMMARY OF THE STUDY

This cross-sectional study assessed the knowledge and attitude of mothers regarding malaria prevention among children under five years old in selected primary health centers in Lagos State. The study aimed to determine the current level of mothers' knowledge and skills in identifying, managing, and understanding malaria transmission; evaluate the effectiveness of insecticide-treated nets in preventing malaria; assess their knowledge of Artemisinin-based combination therapy (ACT) for malaria treatment; and explore the factors affecting malaria prevention practices among mothers of under-five children.

A simple random sampling technique was employed to select 87 caregivers, of whom 84 were validated for the study. Data were collected using a self-developed questionnaire and analyzed through frequency and percentage tables, as well as bar charts, using the Statistical Package for Social Sciences (SPSS) version 25 and Microsoft Excel 2010.

The study found that mothers had a generally good level of knowledge about malaria in children under five. Most (95.2%) had heard of malaria, and the majority (92.9%) recognized that malaria is caused by a parasite transmitted through mosquito bites. About 90.5% knew that malaria can be cured, 66.7% believed it could be prevented, and 64.3% acknowledged it could lead to death. A significant portion (44.0%) identified common malaria symptoms like fever, headache, body and joint pains, vomiting, and loss of appetite, while 35.7% identified stagnant water and bushes/dirty areas as mosquito breeding sites.

Regarding their attitude towards malaria prevention, the study revealed a positive

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outlook overall. A majority (66.7%) viewed malaria as a serious health issue, and 47.6% reported that they and their children sleep under a bed net, with 60.0% always using it and 55.0% acknowledging that the net is treated.In terms of practice, most (76.2%) of the participants reported administering the full treatment course when prescribed antimalarial medication for a sick child, and 71.4% indicated that the child's condition influences their decision to seek care for a fever. Additionally, 38.1% sought medical help within 24 hours when their child had a fever, and 14.3% practiced preventive measures such as using insecticide sprays, mosquito repellents, clearing bushes, eliminating stagnant water, sleeping under treated nets, and maintaining clean surroundings to protect their children from mosquito bites.The study also examined socio-demographic factors affecting malaria prevention practices. Most participants (88.1%) were married, 71.4% lived in urban areas, 64.3% were Christians, 59.5% were self-employed, and 52.4% had a child over five years old. About 47.6% had a tertiary education, 40.5% had an under-five child, and 33.3% were aged between 26-30 years. The study found a significant relationship between mothers' knowledge and attitudes towards malaria prevention in children under five ($p < .05$)

5.5 CONCLUSION

The findings of this study highlight the importance of mothers' knowledge and attitude regarding malaria prevention among children under five years old. The significant relationship between their knowledge and attitude emphasizes the need to enhance their practices in malaria prevention by improving both their knowledge and attitude. This can be achieved through organized community-based workshops and seminars on malaria prevention by health agencies, NGOs, government, and healthcare facilities.

Healthcare providers should educate mothers on recognizing malaria symptoms and the importance of seeking prompt medical attention. Additionally, healthcare professionals should collaborate with community, religious, and influential leaders to promote malaria prevention and support educational efforts. Community health workers should be trained to conduct home visits, and healthcare providers should facilitate peer support groups where mothers can share experiences and motivate each other to prioritize malaria prevention. Local theater groups can be used by government and health agencies to perform culturally relevant skits on malaria prevention and treatment. Furthermore, healthcare management should continuously evaluate the effectiveness of educational programs and adjust strategies as needed based on feedback and outcomes.However, without proper evaluation and improvement of their knowledge and attitude, delays in ensuring consistent malaria prevention practices may result in a gradual decline in the overall effectiveness of malaria prevention among children under five over time.

5.6 RECOMMENDATIONS

Based on the results of this research study, the researcher recommends the following actions to improve mothers' knowledge and attitudes toward malaria prevention for children under five years old in selected primary health centers in Lagos State:

- Health agencies, NGOs, government, and healthcare facilities should organize community-based workshops and seminars to educate mothers on malaria prevention strategies, symptoms, and treatment.
- Government and relevant health agencies should launch public health campaigns using posters, pamphlets,

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and local media to disseminate information on malaria prevention in an accessible and clear manner.

- Healthcare providers should create visual aids, such as charts, posters, and videos, to emphasize the importance of using bed nets, seeking early treatment, and eliminating mosquito breeding sites.
- Educational materials and messages should be adapted to align with the cultural beliefs and practices of the community to ensure greater receptiveness.
- Healthcare providers should educate mothers on how to recognize malaria symptoms in their children and emphasize the importance of seeking prompt medical attention.
- Collaboration with community leaders, religious leaders, and influential figures should be encouraged to advocate for malaria prevention and support educational initiatives.
- Community health workers should be trained to conduct home visits and provide tailored education on malaria prevention to mothers and families.
- Peer support groups should be facilitated where mothers can share experiences, learn from one another, and motivate each other to prioritize malaria prevention.
- Highlight local success stories and mothers who have effectively implemented malaria prevention measures to serve as role models.
- Healthcare providers may offer small incentives or rewards to mothers and families who actively engage in malaria prevention activities or attend educational sessions.
- School nurses and community health workers should introduce malaria prevention education in schools, involving students in spreading knowledge and best practices to their families.
- Child-friendly workshops should be organized to educate children about malaria prevention, empowering them to influence their families.
- Local theater groups can be utilized by the government and health agencies to perform dramas and skits that emphasize malaria prevention and treatment in a culturally relevant way.
- Community clean-up days should be organized by community health workers, in collaboration with community leaders, to eliminate mosquito breeding sites by addressing stagnant water sources, involving mothers and families in the process.
- Healthcare management should promote collaboration between community health workers and healthcare providers to ensure a unified approach to malaria prevention and treatment.
- Healthcare facilities should establish regular follow-up systems to support and ensure that mothers continue practicing malaria prevention measures.
- Healthcare management should assess the effectiveness of educational initiatives regularly and adjust strategies based on feedback and outcomes.
- User-friendly mobile apps may be developed by health agencies to provide mothers with information on malaria prevention, including the use of insecticide-treated bed nets, symptom recognition, and treatment options
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5.7 SUGGESTIONS FOR FURTHER STUDIES

The scope of this study is constrained by financial and time limitations. Therefore, it is recommended that similar research be conducted in other primary healthcare centers, and potentially in secondary healthcare facilities across Lagos State, to broaden the scope and yield more accurate findings that can be generalized in the future. Additionally, such studies could be expanded to evaluate the practice of malaria prevention measures.

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