PREVALENCE AND OUTCOME OF MALARIA INFECTION AMONG CHILDREN BELOW 11 YEARS OF A TERTIARY HEALTHCARE IN BENIN CITY FROM 2022-2024

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IN PARTIAL FULFILMENT OF THE AWARD OF THE DEGREE OF BACHELOR OF NURSING SCIENCE, FACULTY OF NURSING SCIENCES, UNIVERSITY OF BENIN, BENIN CITY

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CERTIFICATION PAGE

This is to certify that this project was carried out by **MICHELLE NKEIRUKA MADUGBA** with matriculation number **BMS1900199**, Faculty of Nursing Sciences, University of Benin, Benin City.

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DEDICATION

This work is dedicated to GOD ALMIGHTY who is providing me with the strength to complete my academic journey.

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I am overwhelmed with gratitude as I reflect on the journey that has led to this research work. I give thanks to Almighty God for His continuous love, mercy, and guidance that brought me this far.

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ABSTRACT

This study investigated the prevalence and outcome of malaria infection among children below 11 years of age in a tertiary healthcare facility in Benin City from 2022–2024. The study aimed to determine the months and years when malaria infection was most prevalent, the gender in which malaria infection was most common, the number of children who had malaria infection, and the treatment outcomes of malaria infection among children below 11 years in a selected tertiary healthcare facility from 2022–2024. The study adopted a non-experimental, retrospective research design method. The study population consisted of all children aged 0 to 10 years who presented with a confirmed diagnosis of malaria at a selected tertiary healthcare facility in Benin City, Edo State, between 2022–2024. A sample size of 900 medical records was selected for the study using a retrospective census sampling technique. A checklist was used for data collection. The instrument was validated by the research supervisor and two other experts in the field. To ensure the reliability of the instrument, a pilot study was conducted prior to full data collection, extracting information from 20 randomly selected pediatric malaria case records not included in the main study. The data collected were analyzed using Statistical Package for Social Sciences (SPSS) version 20 to obtain the Mean, SD, chi-square, and P-value < 0.05. The result shows that malaria was most prevalent in May and in the year 2023, and the treatment outcome of malaria infection had a 95% success rate and a 5% failure rate. Based on the findings, it was recommended that health education by health personnel should be intensified to enlighten parents on the dangers of malaria and ways of preventing it. Mass media outlets such as television, radio, road jingles, and posters should also be used to disseminate useful information on malaria.

Keywords: Malaria, Infection, Prevalence, Outcome, Healthcare

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Malaria remains one of the most significant public health challenges in sub-Saharan Africa, with children under the age of eleven being among the most vulnerable groups. Globally, malaria is a major cause of morbidity and mortality, with an estimated 247 million cases and 619,000 deaths recorded in 2021, 95% of which occurred in the African region (World Health Organization [WHO], 2022). Despite significant progress in malaria control efforts over the last two decades, the burden of the disease remains disproportionately high in low- and middle-income countries, including Nigeria. In fact, Nigeria alone accounted for approximately 27% of the global malaria deaths in 2021 (WHO, 2022).

Children below 11 years, especially those under five, are particularly susceptible to malaria infection due to their immature immunity, which increases the risk of severe disease, complications, and death (Snow et al., 2021). Among the manifestations seen in children, cerebral malaria, severe anemia, and respiratory distress are the most fatal complications. Moreover, repeated malaria infections in early childhood can lead to long-term developmental impairments such as cognitive deficits and poor academic performance (Fernando et al., 2020).

In Nigeria, malaria continues to be a leading cause of outpatient visits, hospital admissions, and deaths among children. The 2021 Nigeria Demographic and Health Survey (NDHS) reported that approximately 23% of children under five tested positive for malaria via microscopy, highlighting the persistence of the disease even amidst ongoing control interventions like insecticide-treated nets (ITNs) distribution, indoor residual spraying, and chemoprevention strategies (National Population Commission [NPC] & ICF, 2022). In regions like Benin City,

located in Edo State, the prevalence of malaria is particularly concerning due to its tropical climate, seasonal rainfall patterns, and socio-economic conditions that favor mosquito breeding and transmission (Okwa, 2022).

Despite the availability of effective diagnostic tools and treatments, challenges such as late presentation to healthcare facilities, self-medication, and limited access to quality care continue to worsen the outcomes of malaria infections among children (Onyeneho et al., 2021). The tertiary healthcare facilities in Benin City, such as the University of Benin Teaching Hospital (UBTH), serve as referral centers where severe and complicated cases are managed, making it critical to understand the patterns of malaria prevalence and outcomes over time.

Previous studies in Nigeria have demonstrated fluctuating trends in malaria prevalence, often influenced by factors such as seasonal variations, intervention coverage, and population movement (Amodu et al., 2021). However, there remains a scarcity of localized data specifically addressing the prevalence and clinical outcomes of malaria among children below 11 years in tertiary hospitals in Edo State. Understanding these patterns between 2018 and 2020 is vital, particularly as this period encompasses significant global and national health events, including the COVID-19 pandemic, which may have disrupted malaria control programs and healthcare-seeking behavior (Sherrard-Smith et al., 2020).

Furthermore, examining the outcomes of malaria infection—ranging from recovery to complications and mortality—provides essential insights for healthcare providers and policymakers. It can help refine intervention strategies, improve clinical management protocols, and enhance health education campaigns targeted at parents and caregivers.

Therefore, this study aims to determine the prevalence and outcomes of malaria infections among children below 11 years who presented at a tertiary healthcare facility in Benin City between 2022 and 2024. By identifying trends, severity, and treatment outcomes, the research seeks to contribute to the evidence base necessary for strengthening malaria control efforts and improving child health outcomes in the region.

1.2 Statement of Problem

According to the 2021 World Malaria Report, Nigeria had the highest percentage of malaria cases (27% of cases globally) and deaths (32% of deaths globally) in 2020. According to the Severe Malaria Observatory for 2020, the country will likely be in charge of 55.2% of all malaria cases in West Africa. Microscopy data from the 2018 Nigeria Demographic and Health Survey (NDHS) show that the prevalence of malaria infection in children under five years of age is 23% (down from 27% in 2015 and 42% in 2010), despite the fact that there are significant regional, rural-urban, and socioeconomic differences (WHO, 2022). From 16% in the South and South East Zones to 34% in the North West Zone, the prevalence varies. There is a 2.4-fold greater prevalence in rural than urban settings (31% vs. 13%). According to Jesupemi Are (2023), prevalence is seven times higher among youngsters in the lowest socioeconomic category than in the richest level (38% vs. 6%).

The incidence of malaria is still increasing daily, despite the fact that substantial research has been done on its prevention and preventative measures against its infection have been implemented. The purpose of this study is to retrospectively examine the prevalence and treatment rates of this malaria infection in children under the age of 11 at the University of Benin Teaching Hospital in Edo State between the years of 2022 and 2024.

1.3 Objectives of the Study

The objectives of the study are:

1. To determine the months and years when malaria infection among children below 11 years was most prevalent in a selected tertiary healthcare in Benin City, Edo State from 2022-2024.
2. To determine the gender among the children below 11 years in which the malaria infection was most prevalent in a selected tertiary healthcare in Benin City, Edo State from 2022-2024.
3. To determine the number of children below 11 years that had the malaria infection in a selected tertiary healthcare in Benin City, Edo State from 2022-2024.
4. To assess the treatment outcome of the malaria infection among children below 11 years in a selected tertiary healthcare in Benin City, Edo State from 2022-2024.

1.4 Research Questions

The following research questions are raised to guide the study:

1. Which months and years from 2022-2024 were malaria infection among children below 11 years most prevalent in a selected tertiary healthcare in Benin City, Edo State?
2. Which of the genders among the children below 11 years was the incidence of malaria infection most prevalent in a selected tertiary healthcare in Benin City, Edo State from 20222-2024?
3. How many children below 11 years had the malaria infection in a selected tertiary healthcare in Benin City, Edo State from 2022-2024?
4. What was the treatment outcome of the malaria infection among children below 11 years in a selected tertiary healthcare in Benin City, Edo State from 2022-2024?

1.5 Hypothesis

There is no significant difference in the relationship between prevalence and outcome of malaria infection among children below 11 years of a selected tertiary healthcare in Benin City, Edo State from 2022-2024.

1.6 Significance of the Study

The results of this study will be applied in developing measures to increase community awareness and understanding of the malaria infection. It will also aid in improving preventive practices and readiness to seek medical treatment on being infected with the malaria parasite. By extension, it will ensure community involvement in malaria preventive practices which will lead to decline in malaria incidence in infants and young children. Again, the outcome of this study will aid the government take steps and implement effective and strategic initiatives to help medical professionals ensure that the survival rate rises following treatment of malaria especially in infants.

1.7 Scope of Study

This study will be carried out in two (2) wards of a tertiary healthcare in Benin City, Edo State. The tertiary healthcare is the University of Benin Teaching Hospital (UBTH). All the patients admitted in Children Departments from the beginning of 2022 to the end of 2024.

1.9 Operational Definition of Terms

1. **Prevalence of Malaria:** The total number of cases of the malaria infection in a given population at a stipulated amount of time when compared with the total number of individuals in that population.
2. **Outcome of Malaria:** It is that which is produced or occurs as a result of an infection with the malaria parasite.
3. **Gender:** Sex a category, either male or female, into which a population is divided.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter seeks to provide insight into the burden of malaria in children and its effects on their health. This chapter aims to explore the prevalence and outcome rates of malaria infection, seasonal variation in epidemiology of malaria, gender differences in malaria prevalence, and the demographic characteristics of affected children, and the associated risk factors.

2.1 Conceptual Review

Malaria is a significant global health challenge, particularly in developing countries, where it is a leading cause of morbidity and mortality. According to the World Health Organization (WHO), there were an estimated 229 million cases of malaria and 409,000 deaths attributable to the disease in 2019, with the highest burden of disease in sub-Saharan Africa (World Health Organization, 2020)

Children below the age of 11 are among the most vulnerable populations for malaria infection and its complications, due to their developing immune systems and increased susceptibility to severe forms of the disease. Malaria in children can cause a range of symptoms, including fever, anemia, respiratory distress, and neurological complications, which can result in long-term cognitive impairment or death (WHO., 2022)

The prevalence of malaria in children below the age of 11 is a critical measure of the burden of the disease in a given population. Prevalence rates can be determined through various methods, such as active case detection or cross-sectional surveys. In addition to providing an estimate of the number of children affected by the disease, prevalence rates can also be used to monitor

trends in malaria transmission and assess the effectiveness of prevention and control interventions. In recent years, there has been progress in reducing the global burden of malaria, including in children under 5 years old. However, the burden of the disease in older children remains a significant challenge, with an estimated 23% of all malaria deaths occurring in children aged 5-14 years(Cohen et al., 2021; Health Organization, 2020)

The outcome rates of malaria in children below the age of 11 are also critical for understanding the impact of the disease on affected populations. Outcome rates can include measures such as mortality, morbidity, and treatment outcomes. For example, in areas with high malaria transmission, anemia is a common complication of malaria infection, particularly in young children. Outcome rates can be used to assess the effectiveness of interventions aimed at preventing and treating anemia and other complications of malaria infection. In addition to the direct health impacts of malaria, the disease also has broader economic and social consequences, particularly in low-income settings. Malaria can reduce productivity and contribute to poverty, particularly among households with limited access to health care (Bhatt et al., 2021; Salam et al., 2021).

The prevalence and outcome rates of malaria in children below the age of 11 are critical measures of the burden of the disease in affected populations. Understanding these rates is crucial for designing effective prevention and treatment strategies, as well as for monitoring progress towards reducing the burden of malaria in affected populations. Continued efforts to improve the prevention, diagnosis, and treatment of malaria in children are essential for achieving global malaria elimination goals (Weiss et al., 2021; Zinszer et al., 2021).

2.1.1 Review of Malaria

Malaria is an illness caused by a genus of parasite known as Plasmodium. This parasite is transmitted from the vector (Anopheles mosquitoes) to a host through a bite. The genus Plasmodium responsible for malaria in humans are Plasmodium falciparum, Plasmodium ovale, Plasmodium vivax, Plasmodium knowlesi, and Plasmodium malariae. However, Plasmodium falciparum and Plasmodium vivax are the major cause of malaria in humans. It is worthy of note that Plasmodium falciparum is considered the deadliest because of its variant-drug-resistance on the disease strain. In 2022, the World Health organization (WHO) reported that there were 207 million instances of malaria leading to over 627, 000 deaths with 90% of these cases in Africa. Before the year 2000, majority (54%) of the mortality cases of malaria were in children. One of the major factors of malaria prevalence in recent time is the resistance of Plasmodium to antimalarials. According to Center for Disease Control and Prevention (CDC), resistance to antimalarial drugs is the ability of Plasmodium parasite to continue multiplying even when a relatively higher dose than required but within the subject's tolerance range is administered an absorbed. Resistance occurs when the sensitivity of the parasite strain is reduced by extemporaneous mutations. The erythrocyte stage of the Plasmodium parasite is affected by these mutations which orchestrate the resistance, thereby affecting the metabolic and effect of the medication (Thomas, 2024).

2.1.2 Pathology of Malaria

Malaria is a disease of humans and other animals borne by infected female Anopheles mosquitoes. The causative agent of the disease is a parasite of genus Plasmodium. The vector (female Anopheles) carries the Plasmodium in its saliva which it transmits to other hosts when it bites. When the Plasmodium enters the circulatory system of a host, it makes it way to the liver

where they groom and reproduce for a minimum of five days before infecting the red blood cells. The parasite attacks the red blood cells and when this happens, the host begins to feel most of the symptoms of malaria. The infected red blood cells could block capillaries in the brain leading to Cerebral malaria which considered the deadliest instance of malaria. The symptoms of the infectious disease include; fever, headache, and in chronic instances may lead to death. Malaria is mostly suffered in Sub-Saharan Africa, Asia and Americas. The Medieval Italians associated the disease to sloughs and swamps and as such named it marsh fever. Later the nomenclature of the disease was anecdotally called mala aria which means 'bad air'. Plasmodium falciparum and Plasmodium vivax are chiefly responsible for malaria in humans while some other mammals and Aves suffer malaria transmitted from other species of Plasmodium. Children below 15 years of age have been found to suffer malaria more. Also, on a yearly basis, over 125 million pregnant women are reported to have malaria. Some factors are considered as predisposal to malaria which includes; rainfall, lasting high temperatures, stagnant waters and high humidity. Malaria can be transmitted from human to human through blood transfusion, organ transplant, and sharing of piecing objects. The life cycle of the parasite in human goes from the early trophozoite to mature trophozoite to late schizont to merozoites to ring stage. This life cycle takes approximately 48 hours. The elaborated Mosquitoes Stages, Human Liver Stages and the Human Blood Stages are presented in figure 1;

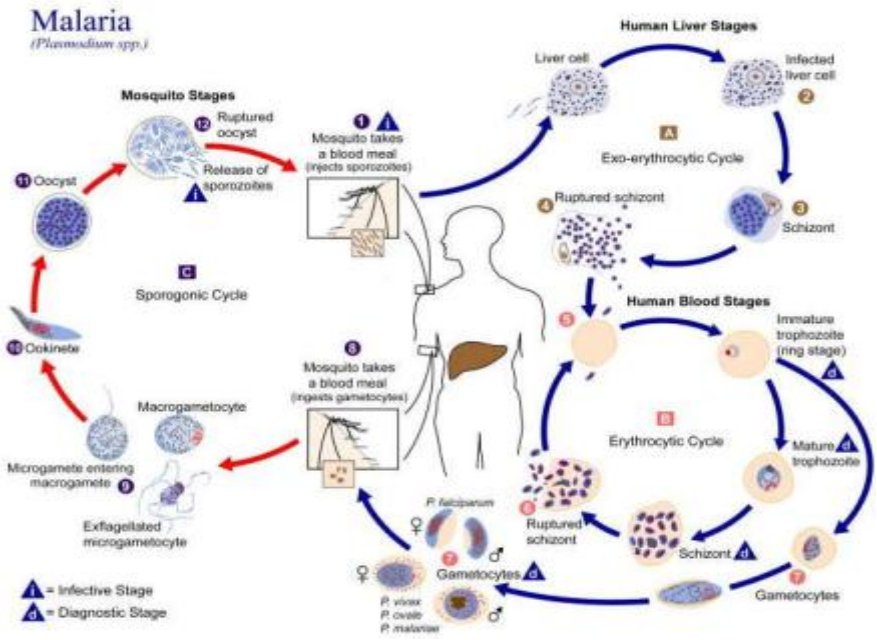

Fig 1: life cycle of Plasmodium

Malaria can be recurrent depending on the scenario in play; recrudescence is the recurrence of malaria after a period of no symptoms. This happens when the parasite in the liver cells survive due to paltry or ineffectual treatment. Relapse malaria happens when a dormant hypnozoites persists after the parasite have been eradicated from the blood. This type of recurrence is attributed to two species of Plasmodium – vivax and ovale and happens within a period of 8-24 weeks. Reinfection is another recurrence instance of malaria and it is chiefly as a function of unsuccessful treatment. In humans, the symptoms of malaria start around 8-25 days after infection. Weakness, decreased consciousness, lack of appetite, low blood pressure, problems with breathing, circulatory shock, failure of the kidney, bleeding, pulmonary edema, thrombocytopenia, etc. are some of the symptoms. There are two most common diagnoses for malaria; microscopic examination of blood and antigen-based rapid diagnostic test. The choice of diagnosis is boarders around affordability and medical necessity. Malaria can be prevented by

a) vector control b) indoor residual spraying c) use of Mosquito nets d) prophylactic drugs (not recommended for residents of malaria-endemic areas) (Ali, 2012).

2.1.3 Malaria Progress Report of 2021

African communities were not to reduce the death tolls of malaria by 40% in 2020 and from the look of things, the continent of Africa will not be able to achieve the 'Eradicate Malaria by 2030' campaign. The incidence of Covid-19 had a huge disruptive effect on the malaria elimination programs which the African communities embarked on in 2019 after reviewing the mortality rate of malaria which was in excess of 68, 953 deaths. Lack of funds and advocacy are the most challenging factors towards achieving the strategic plans the member states have laid out towards eradicating malaria (WHO, 2021).

2.1.4 Malaria in 2022: Increasing Challenges, Cautious Optimism

The fight against malaria was encouraging before the emergence of resistant-strains of the disease in recent times. The resistance of female Anopheles mosquito to pyrethroids which is the major insecticide deployed in long lasting insecticidal bed nets is one of the challenges in combating malaria in recent times. Artemisinin-based combination therapy has been the major treatment in areas where falciparum malaria in rampant. However, in recent times there have been reports of artemisinin-resistant Plasmodium falciparum and this is the major challenge. Appropriate quarters are preoccupied with finding ways to stop or treat Artemisinin-resistant falciparum malaria. A few drugs are currently in their developmental stages and one of such drugs include the KAF-156 which has shown a positive result in fighting artemisinin-resistant Plasmodium falciparum. A milestone to achieve in combating malaria would be to develop a

vaccine that would treat existing infections and prevent future infections. (Jagannathan & Kakuru, 2022).

2.2 Theoretical literature

The theory that underpinned this study is social ecological model.

The Social-Ecological Model

The Social-Ecological Model (SEM) is a widely used theoretical framework that explains how multiple levels of influence interact to affect individual health behaviors, health outcomes, and overall well-being. Initially developed in the fields of psychology, sociology, and public health, SEM emphasizes that individual behavior is not determined solely by personal choices but is influenced by a complex interplay of social, environmental, and policy factors. The model provides a holistic perspective, recognizing that health outcomes are shaped by interactions across multiple layers—from personal characteristics to broader societal influences (McLeroy et al., 1988). This makes it particularly relevant in understanding complex health issues such as malaria prevalence among children, where biological, social, environmental, and systemic factors converge to impact disease outcomes.

Levels of the Social-Ecological Model

The SEM typically includes five interconnected levels of influence: **individual, interpersonal, organizational, community, and policy**. Each level contributes uniquely to shaping health behaviors and outcomes, and interventions designed using SEM often target multiple levels simultaneously to maximize effectiveness.

1. Individual Level

The individual level encompasses personal characteristics that influence health behavior and susceptibility to disease. These factors include age, sex, genetic predisposition, knowledge, attitudes, beliefs, and skills. In the context of malaria, individual-level factors include a child's age, nutritional status, prior exposure to malaria, and immune response. For example, younger children under five are more susceptible to severe malaria due to underdeveloped immunity (WHO, 2023). Personal knowledge and attitudes of caregivers regarding malaria prevention—such as the use of insecticide-treated bed nets, timely recognition of symptoms, and adherence to treatment regimens—also significantly influence health outcomes. Addressing individual-level factors involves educational interventions that improve knowledge and promote positive health behaviors.

2. Interpersonal Level

The interpersonal level refers to the social relationships and networks that influence behavior, including family, friends, peers, and caregivers. These relationships shape norms, provide social support, and can either facilitate or hinder healthy behaviors. For instance, parental knowledge and practices regarding malaria prevention, such as ensuring children sleep under treated nets or promptly seeking medical attention when fever develops, directly affect a child's risk of infection and disease outcome. Family members' attitudes toward modern medicine versus traditional remedies can also impact adherence to treatment protocols. In addition, peer influence and community social networks can spread awareness, reinforce healthy behaviors, and provide support for families managing illness (Bronfenbrenner, 1979).

3. Organizational Level

Organizations, including healthcare facilities, schools, and workplaces, influence health behaviors by providing access to resources, establishing norms, and implementing policies. In malaria prevention and control, healthcare organizations play a critical role by providing diagnostic services, distributing insecticide-treated nets, and offering antimalarial medications. Hospitals and clinics that adhere to standardized malaria treatment protocols ensure consistent and effective care for children. Schools can also act as platforms for health education, teaching children about malaria prevention and encouraging healthy behaviors that extend into their households. Nurses, as frontline healthcare providers, function within these organizations to deliver education, monitor health outcomes, and advocate for patient-centered interventions (McLeroy et al., 1988).

4. Community Level

The community level encompasses broader social, cultural, and environmental factors that influence health. This includes the physical environment, local norms, cultural practices, community health initiatives, and the availability of resources such as clean water, sanitation, and mosquito control programs. In malaria-endemic areas, community-level factors are critical in shaping disease prevalence. Environmental conditions such as stagnant water, poor drainage, and inadequate housing increase mosquito breeding sites, directly affecting malaria transmission. Community-wide interventions, such as mass distribution of insecticide-treated nets, indoor residual spraying, and public health campaigns, are essential for reducing the burden of malaria. Furthermore, cultural beliefs and community norms influence health behaviors, including the acceptance of medical interventions and preventive measures (Trevino et al., 2018).

5. Policy Level

The policy level refers to local, regional, and national regulations, laws, and policies that govern health systems and influence population health. Public policies can facilitate or hinder access to preventive and curative services. For malaria control, policies that provide funding for public health programs, ensure the availability of antimalarial medications, subsidize the distribution of bed nets, and support training of healthcare workers are critical. Policies promoting universal access to healthcare, effective surveillance, and timely reporting of malaria cases also strengthen the overall healthcare system's response. Nurses and healthcare professionals play a vital role in advocating for policies that prioritize vulnerable populations, particularly children under eleven, who are at higher risk of malaria infection (WHO, 2023).

Application of the Social-Ecological Model to the Study

The **Social-Ecological Model (SEM)** offers a comprehensive framework for understanding the factors that influence the prevalence and outcomes of malaria infections in children, particularly in a tertiary healthcare setting like Benin City. The model highlights that malaria is not only a result of individual behaviors but is also shaped by the broader socio-environmental, community, and policy-level factors. Applying the SEM to the study of malaria prevalence and outcomes among children under 11 years old in Benin City allows for a more holistic examination of the determinants of health, thus guiding the development of multi-layered interventions aimed at reducing malaria transmission and improving patient outcomes.

1. Individual Level

At the **individual level**, the study will explore how children's age, nutritional status, immune system development, and prior exposure to malaria influence both the likelihood of infection and

the severity of the disease. Younger children, particularly those under five years of age, are more vulnerable to malaria due to their developing immune systems. The study can assess whether these children are at higher risk for severe malaria outcomes, including cerebral malaria and anemia, compared to older children within the age group (under 11 years). Factors such as the child's previous history with malaria infections, their overall health status, and whether they have received malaria prevention interventions (e.g., insecticide-treated nets) could also be important to examine. Understanding these individual-level characteristics will help determine the vulnerability of children in Benin City and guide personalized approaches to treatment and prevention.

Furthermore, individual behaviors, such as whether caregivers ensure that children sleep under bed nets or whether there is compliance with prescribed antimalarial treatment, will also be studied. The study can explore whether a lack of knowledge about malaria symptoms and prevention methods among parents and caregivers contributes to higher infection rates. The Health Belief Model, which is part of SEM, could be applied here to understand how parents' perceptions of malaria risk, severity, and preventive measures affect their behavior and, consequently, the prevalence of malaria in children.

2. Interpersonal Level

At the **interpersonal level**, the study will explore how family dynamics, including the roles of caregivers, influence malaria prevalence and outcomes in children. Relationships between caregivers (such as parents, siblings, and extended family members) and children significantly impact adherence to malaria prevention measures. For example, if a caregiver does not fully understand or prioritize the importance of using insecticide-treated nets or taking malaria

prophylaxis, children may be more vulnerable to malaria infections. Furthermore, family practices regarding seeking medical attention when symptoms arise will influence how quickly children are treated and whether they receive timely, appropriate care, potentially reducing the severity of infections.

This level of analysis could also involve examining social networks within the community. Social norms, such as how malaria is perceived within the community, might influence how families respond to symptoms or seek treatment. If the community does not prioritize early malaria diagnosis and treatment, the infection rates may remain high. This level of analysis provides insight into how peer and family support can be leveraged for better disease prevention and health-seeking behaviors.

3. Organizational Level

The organizational level refers to healthcare institutions, such as the tertiary healthcare facility in Benin City, and how they contribute to malaria prevention and treatment. The study will assess whether the healthcare facility has adequate resources for diagnosing and treating malaria, such as access to rapid diagnostic tests (RDTs) and antimalarial medications. Inadequate resources, such as shortages of essential medications or diagnostic tools, could lead to delayed diagnoses and treatments, contributing to more severe malaria outcomes. The quality of healthcare provided such as the timeliness of care, the expertise of healthcare providers, and the integration of malaria treatment guidelines into daily practice will be crucial in understanding the outcomes of malaria infection in the pediatric population.

The presence or absence of structured malaria prevention programs in the hospital, such as the distribution of insecticide-treated nets and regular malaria awareness campaigns, also falls under

this level. Nurses, doctors, and other healthcare professionals in the hospital setting play a key role in educating families and caregivers about the importance of prevention and the need for early medical intervention. Organizational factors, such as the availability of trained healthcare workers and the efficiency of malaria treatment protocols, will significantly influence the study's findings regarding the outcome of malaria infections among children.

4. Community Level

At the community level, the focus is on the broader socio-environmental factors that contribute to malaria transmission. In Benin City, environmental conditions such as stagnant water, poor sanitation, and inadequate waste management create ideal breeding grounds for *Anopheles* mosquitoes, the vector of malaria. The study will examine how the community's infrastructure and environmental health practices influence the prevalence of malaria. Public health initiatives aimed at improving sanitation, waste disposal, and vector control, such as spraying for mosquitoes and clearing standing water, will be evaluated for their effectiveness in reducing malaria transmission.

Additionally, community health workers and local health organizations play a vital role in malaria prevention efforts. Community-based interventions, such as the distribution of bed nets, educational programs about malaria symptoms, and the promotion of early healthcare-seeking behaviors, can significantly reduce the prevalence and severity of malaria in children. The study will assess the community's level of awareness and the availability of prevention programs, and how this correlates with malaria infection rates in children.

5. Policy Level

The policy level includes government regulations, laws, and policies that shape malaria control programs at the national and local levels. The study will consider how policies on malaria prevention, such as subsidies for antimalarial drugs, insecticide-treated nets, and public health campaigns, influence the prevalence and outcome of malaria among children in Benin City. National policies on malaria control, such as the Roll Back Malaria initiative and the World Health Organization's (WHO) guidelines on malaria treatment, provide a framework for local action. However, the effectiveness of these policies depends on local implementation, including funding for public health initiatives, public awareness campaigns, and the availability of healthcare resources. The study can also explore how local government initiatives support or hinder malaria control efforts. For example, if there are gaps in government funding for malaria prevention programs or if local healthcare systems are under-resourced, it can result in higher malaria prevalence and poorer outcomes, particularly in vulnerable populations like children.

2.3 Empirical Review

2.3.1 Seasonal Variation in the Epidemiology of Malaria in Children below 11 years

According to Tiedje et al., 2021 who conducted a study on the age-specific trends and factors that increase the risk of asymptomatic Plasmodium falciparum infections, malaria has been a major cause of infant death in Bangladesh. The purpose of their study was to investigate the age-specific trends and factors that increase the risk of asymptomatic Plasmodium falciparum infections in Bangladesh. To achieve this, the study utilized both traditional microscopy and sensitive molecular methods to provide a more precise understanding of the reservoir of P. Falciparum. The presence of Plasmodium falciparum that affects specific age groups was common, and it was often found as asymptomatic microscopic or sub-microscopic infections in

people of all ages. In both Survey 1 and Survey 2, the greatest occurrence of a Plasmodium falciparum infection that was visible through a microscope was observed in children aged 6 to 10 years. As the age group increased, the prevalence of infection reduced as expected. Specifically, during the wet season, 62.4% of 6 to 10-year-olds had microscopic P. falciparum infections, while in the dry season, 42.1% of children in the same age group had such infections. However, the adolescents between the ages of 11 to 20 years had the highest occurrence of sub-microscopic Plasmodium falciparum infections among the participants who tested negative through microscopy in both Survey 1 and Survey 2. Specifically, at the end of the wet season, 69.8% of 11 to 20-year-olds who tested negative through microscopy had sub-microscopic P. falciparum infections, while at the end of the dry season, 37.7% of 11 to 20-year-olds who tested negative through microscopy had sub-microscopic P. falciparum infections. In both cross-sectional surveys, the occurrence of parasite decreased with increasing age. However, it was unexpected that among participants aged over 20 years, sub-microscopic Plasmodium falciparum infections made up more than half of the total asymptomatic infections detected through both microscopy and 18S rRNA PCR methods. This was in contrast to the younger age groups, where the majority of infections were visible through microscopy. Conclusively, they added that; Most of the malaria control measures implemented across Sub-Saharan Africa (SSA) are aimed at reducing the mortality rate of children below the age of 5 years. This is because this age group is the most affected by clinical malaria in areas with high transmission rates. Also, that while reducing the impact of malaria on children is crucial, it's also necessary to prioritize asymptomatic infections in older age groups. Even though such infections are less likely to lead to clinical symptoms requiring treatment, they contribute to the reservoir of Plasmodium falciparum infections and sustain the transmission of the disease. This study provides clear

evidence that to achieve malaria elimination, it's necessary to address the reservoir of asymptomatic Plasmodium falciparum infections present in both children and adults. This requires implementing appropriate intervention strategies to tackle the disease.

A study by Samdi, Ajayi & Oguche, (2021) on Seasonal Variation of Malaria Parasite Density in Paediatric Population of North Eastern Nigeria. This study was carried out in 2013 and 2014 to provide parasitological baseline data for the development of Malaria Early Warning System (MEWS) for the surveillance of type I epidemic caused by meteorological conditions and to provide data for timing malaria key vector control measures such as Indoor Residual Spraying (IRS) for maximum effect. Clinical information about malaria cases were used in this study. In all 692 children aged 6 to 96 months were screened for Plasmodium infection and used for the analysis. The results showed that the majority of infected children (68.06%) were aged 12-60 months and their asexual parasite density (ap/ u1) was between 100-500 ap/u1 of the whole blood. The month of September recorded the highest Geometric Mean Asexual-Densities (GMPD) of 13,655 while the lowest parasite densities were observed at the peak of the dry season, especially during the months of March and April. Significance difference ($p<0.05$) was observed between the sexes in infection rate. It is obvious that male children have higher infection rate (about 67.5%), than while female children (32.5%) regardless of climate seasonality. The study therefore recommends that designing a malaria early warning system and providing baseline parasitological data for timing of spraying cycles for key malaria vector control measures such as Indoor Residual Spraying (IRS) should be encouraged to complement other effective malaria control strategies.

2.3.2 Gender differences in malaria prevalence among children below 11 years

Afrane et al., 2021 studied the Gender differences in asymptomatic malaria infections in children in a malaria-endemic area of Ghana. I doing this, used a cross-sectional design to investigate gender differences in asymptomatic malaria infections. Malaria infections were diagnosed using rapid diagnostic tests and microscopy, and demographic and socioeconomic data were collected through interviews with the children's caregivers. The study was conducted in a rural area of Ghana with high malaria transmission rates and limited access to healthcare and prevention methods. The study included 1,089 children under the age of 11 in a malaria-endemic area of Ghana. The sample population had a relatively balanced gender distribution, with 47.5% girls and 52.5% boys. The study found that girls had a significantly higher prevalence of asymptomatic malaria infections than boys (23.2% vs. 16.7%). The gender differences in malaria prevalence were particularly pronounced among children aged 5-10 years. The findings suggest that girls in malaria-endemic areas of Ghana are at a higher risk of asymptomatic malaria infections than boys, particularly as they get older. The study highlights the need for gender-sensitive interventions to address this disparity and reduce the burden of malaria among children in sub-Saharan Africa.

In another study carried by Nantcha et al., 2021 on gender inequality as regards malaria prevalence. The study was a cross-sectional analysis across 34 sub-Saharan African nations. They used a meta-analysis to investigate the relationship between gender inequality and malaria prevalence among children. Malaria infections were diagnosed using a combination of clinical and laboratory methods, and demographic and socioeconomic data were collected through surveys. The surveys were conducted in various countries in sub-Saharan Africa, including Cameroon, Kenya, Nigeria, and Tanzania. The study included data from 34 surveys conducted in

sub-Saharan Africa between 2000 and 2017. The surveys included a total of 187,380 children under the age of 11, with a relatively balanced gender distribution (50.6% girls and 49.4% boys). The study found that the overall prevalence of malaria was higher among girls than boys across the 34 surveys included in the meta-analysis. The gender differences in malaria prevalence were particularly pronounced in areas with high levels of gender inequality, such as lower rates of female literacy and lower levels of women's participation in the workforce. The findings suggest that gender inequality is an important factor contributing to the gender differences in malaria prevalence among children in sub-Saharan Africa. Addressing gender inequality through interventions such as promoting girls' education and women's economic empowerment could help reduce the burden of malaria among children in the region.

Sagna et al., 2021 carried research on gender differences in the prevalence and severity of malaria among children under five in Kedougou, Senegal. A cross-sectional design was adopted to investigate gender differences in malaria prevalence and severity among children. Malaria infections were diagnosed using microscopy, and demographic and clinical data were collected through interviews with the children's caregivers. The research was conducted in Kedougou, a rural area of Senegal with high malaria transmission rates and limited access to healthcare and prevention methods. The research population included 1,101 children under the age of 5 in Kedougou, Senegal. The sample population had a relatively balanced gender distribution, with 49.3% girls and 50.7% boys. The study found that there were no significant gender differences in the prevalence of malaria among children under 5 in Kedougou. However, girls were more likely than boys to experience severe malaria, as evidenced by higher rates of anemia and hospitalization. The findings suggest that while there may not be significant gender differences in malaria prevalence among young children in Kedougou, girls are more likely to experience

severe malaria and its complications. The study highlights the need for gender-sensitive interventions to address the gender disparities in malaria severity and reduce the burden of malaria among children in sub-Saharan Africa.

2.2.3 Treatment outcome of the malaria infection among children below 11 years

To assess treatment outcome of malaria infection among children under five years of age in a tertiary hospital in southwestern Nigeria, Afolabi et al., 2021 embarked on a study using a retrospective review of medical records of 368 children who were diagnosed with malaria and treated at the hospital between January and December 2015. The study found that the overall treatment success rate was 90.8%, with a failure rate of 9.2%. The study concluded that the use of Artemisinin-based Combination Therapy (ACT) as a first-line treatment for uncomplicated malaria in children is effective and should be sustained.

Uduro et al, 2021 investigate the burden and epidemiology of severe falciparum malaria among children under five years of age in the Kassena-Nankana district of northern Ghana. The research was conducted using a cross-sectional survey of 2,329 children under five years of age. The study found that severe malaria was more prevalent among male children, and that the majority of cases occurred during the rainy season. The study concluded that the implementation of effective malaria control measures is crucial to reducing the burden of severe malaria among children in northern Ghana.

Overall, the empirical literature suggests that while several effective malaria control measures have been implemented, overtime the prevalence and outcome rate has not been able to be sustained. Strategies to address these such as, treating based on age grade and gender.

CHAPTER THREE

METHODOLOGY

This chapter presents the methods used and the tools employed for the goal of this research. This comprises the following: the study environment, research design, sampling strategy, target population, sample size, data collection instrument, validity and reliability of the instrument, data collection method, ethical consideration, and data analysis method.

3.1 Research Design

The study will adopt a non-experimental, retrospective research design method. This approach entailed gathering and describing subject-provided data without alterations. This research design will be chosen because it involves collecting data through observation or survey without manipulating any variables or controlling the environment to ensure unadulterated results.

3.2 Research Setting

This research will be carried out at University Benin Teaching Hospital, an institution of tertiary healthcare situated in Egor Local Government Area of Edo State, Nigeria. The University of Benin Teaching Hospital (UBTH) was established in 1973 as the General Hospital, Benin City. It was upgraded to a teaching hospital in 1975 and was subsequently renamed the University of Benin Teaching Hospital. UBTH is a tertiary healthcare facility that offers patients from Edo State and other states in Nigeria specialized medical services such renal dialysis, chemotherapy, and open-heart surgery. In addition, it serves as a place for medical students, residents, and other healthcare experts to receive training. UBTH has improved its facilities and services throughout the years, such as the introduction of a modern diagnostic center, a cancer treatment center, and a reproductive health center. Furthermore, it has carried out a range of quality improvement

initiatives and has been recognized with numerous awards for its exceptional healthcare provision.

3.3 Target Population

The study population consisted of all children aged 0 to 10 years who presented with a confirmed diagnosis of malaria at a selected tertiary healthcare facility in Benin City, Edo State, between January 2022 and December 2024. The inclusion criteria for the sample were:

(1) children below the age of 11 years,

(2) clinical and laboratory-confirmed diagnosis of malaria, and

(3) complete medical records regarding diagnosis, treatment, and clinical outcomes.

Children with incomplete records, those referred from or to other facilities without complete follow-up data, and those diagnosed solely on clinical suspicion without laboratory confirmation were excluded from the study.

3.4 Sample Size

Sample

The sample size was determined using a formula for estimating prevalence in a population, considering a previous hospital-based malaria prevalence among children in Nigeria of approximately 30% (Amodu et al., 2016), a confidence level of 95%, and a margin of error set at 5%. However, due to the retrospective nature of the study and the available medical records during the study period, a census sampling approach was adopted, and all eligible cases meeting the inclusion criteria were reviewed.

Sampling Technique

A retrospective census sampling technique was employed for this study. Census sampling involves the inclusion of all cases within the defined population that meet the eligibility criteria during the specified timeframe. This technique was considered appropriate because it allowed the researchers to capture the full extent of malaria prevalence and clinical outcomes among children attending the tertiary healthcare facility, thus reducing the risk of selection bias and enhancing the generalizability of the findings to similar hospital settings.

Medical records from the hospital's pediatric wards, outpatient malaria clinics, and laboratory services were systematically reviewed. Data extraction was done using a structured data collection form designed to capture variables such as age, gender, type of malaria infection (e.g., uncomplicated or severe), treatment regimens administered, response to treatment, complications, and outcomes (recovery, prolonged hospitalization, or mortality).

This approach ensured a comprehensive analysis of the burden and outcomes of malaria infection among children below 11 years in the facility over the three-year study period.

3.6 Instrument for Data Collection

In order to collect information from the medical records of the children, a checklist will be created. The Medical Records of UBTH will provide the pertinent information regarding the target children and their prevalence of malaria infections.

Validity

To ensure the validity of the research instrument, a structured data extraction form was developed based on standard malaria case management guidelines provided by the World Health Organization (WHO, 2015) and the Nigerian Federal Ministry of Health (FMOH, 2020). The form included variables such as patient demographics, diagnostic methods (microscopy or rapid

diagnostic test confirmation), malaria type (uncomplicated or severe), treatment protocols, clinical outcomes, and length of hospital stay.

Content validity was ensured by consulting relevant literature and clinical protocols to guide the selection of variables included in the data extraction form. Furthermore, the instrument was subjected to expert review. Three specialists—a pediatrician, a clinical epidemiologist, and a public health expert—reviewed the data collection form for comprehensiveness, relevance, clarity, and appropriateness. Their feedback was incorporated to refine the tool to ensure that it adequately captured all critical information related to the prevalence and outcomes of malaria infections in the target population.

Face validity was established by pre-testing the instrument on a small subset of 10 randomly selected medical records from a previous year (2017) that were not part of the study period. This helped to ensure that the data extraction form was simple, clear, and easy to use without ambiguity or misinterpretation.

Reliability

Reliability of the instrument was ensured through a pilot study conducted prior to full data collection. The pilot involved extracting information from 20 randomly selected pediatric malaria case records not included in the main study. Two independent research assistants used the tool to collect data from the same records. The results were then compared for consistency.

Inter-rater reliability was assessed by calculating Cohen's kappa coefficient, which measures agreement between two raters. A kappa value of 0.82 was obtained, indicating strong agreement and high reliability of the instrument (Landis & Koch, 1977).

In addition, to maintain reliability during the main study, data collectors received training on how to use the data extraction form accurately and consistently. Periodic supervision and spot-

checking of extracted data were conducted by the principal investigator to minimize errors and ensure consistency throughout the study period.

Thus, the instrument was demonstrated to be both valid and reliable for collecting accurate, consistent, and relevant data on the prevalence and outcomes of malaria infection among children below 11 years in the selected tertiary healthcare facility.

3.8 Method of Data Collection

The research assistants will receive training on how to use the checklist to gather information from the medical case notes in the Pediatric and Pediatric-extension wards (P ward and P-ext ward) of UBTH. The research authorization was gotten from the Ethics committee of the University of Benin Teaching Hospital, Nigeria. Authorization for the records will be taken from Medical Records University of Benin Teaching Hospital, Benin City, Edo state, Nigeria. Data collection will last for two weeks from Monday to Friday, 8am to 2pm daily.

3.9 Method of Data Analysis

Data collected will be analyzed using Statistical Package for Social Sciences (SPSS) version 20. Mean, SD, chi-square, P-value < 0.05 were earmarked as variable of relevance.

3.10 Ethical Consideration

The research authorization will be sought from the Ethics committee of the University of Benin Teaching Hospital, Nigeria. Authorization for the records will be taken from Medical Records University of Benin Teaching Hospital, Benin City, Edo state, Nigeria.

CHAPTER FOUR

RESULTS

This chapter presents the results of this research. The results consist of findings generated from data collected using checklist.

Table 4.1: Socio-demographic characteristics of respondents

Variables	Attributes	Frequency	Percentage
Age (years)	0-2	250	27.8
	3-6	385	42.8
	7-11	265	29.4
Gender	Male	385	42.8
	Female	515	57.2
Educational Status	Infants	150	16.7
	Preschool	225	25
	Primary	525	58.3
Religion	Christianity	625	69.4
	Muslim	275	30.6

n=900 respondents

Table 4.1 showed the socio-demographic characteristics of respondents, most 385(42.8%) of the respondents are within 3-6 years, 250(27.8%) are within 0-2 years while 265(29.4%) are within 7-11 years. Most 515(57.2%) of the respondents are females while 385(42.8%) are males. Few 25% of the respondents are in pre-schools, 16.7% of the respondents are infants while 58.3% are in primary school. Most 625(69.4%) of the respondents are Christians while 275(30.6%) are Muslim.

Objective One: Months And Years When Malaria Infection Among Children Below 11 Years Was Most Prevalent

Table 4.2: Months and Years when Malaria Infection among Children below 11 Years was most Prevalent

Months Years	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Total
2022	20	18	22	17	23	15	25	30	10	20	25	15	240
2023	30	25	35	20	40	28	32	30	15	45	35	25	360
2024	25	20	30	20	30	24	26	22	28	21	29	25	300
Total	75	63	87	57	93	67	83	82	53	86	89	65	900

Table 4.2 showed the months and years when malaria infection among children below 11 years was most prevalent. From the table above, malaria infection among children below 11 years were most prevalent in May and the year it was most prevalent is 2023.

Objective Two: The Gender Among The Children Below 11 Years In Which The Malaria Infection Was Most Prevalent

Table 4.3: The Gender Among The Children Below 11 Years In Which The Malaria Infection Was Most Prevalent

Gender	Frequency
Male	385 (42.8%)
Female	515 (57.2%)

Table 4.3 showed the gender among the children below 11 years in which the malaria infection was most prevalent. From the table above, malaria infection among children below 11 years were most prevalent in females.

Objective Three: Number Of Children Below 11 Years That Had The Malaria Infection In A Selected Tertiary Healthcare In Benin City, Edo State From 2022-2024.

Table 4.4: Number Of Children Below 11 Years That Had The Malaria Infection In A Selected Tertiary Healthcare In Benin City, Edo State From 2022-2024.

Years	Frequency
2022	240
2023	360
2024	300
Total	900

Table 4.4 showed the number of children below 11 years that had the malaria infection in a selected tertiary healthcare in Benin city, Edo State from 2022-2024. From the table above, 900 children below 11 years that had malaria infection from 2022-2024.

Objective Four: Treatment Outcome Of The Malaria Infection Among Children Below 11 Years

Table 4.5: Treatment Outcome Of The Malaria Infection Among Children Below 11 Years

Outcome	Frequency
Survivals	855 (95%)
Death	45 (5%)

Table 4.5 showed that treatment outcome of the malaria infection among children below 11 years. From the table above, the treatment outcome of the malaria infection have a survival rate of 95% and a death rate of 5%.

CHAPTER FIVE

DISCUSSION OF FINDINGS, CONCLUSION, SUMMARY AND RECOMMENDATION

This chapter entails the discussion of findings, implication for nursing, summary, conclusion, recommendation and suggestion for further studies.

5.1 Discussion of Findings

This research work assessed prevalence and outcome rates of this malaria infection in children below the age of 11 in University of Benin Teaching Hospital, Edo State from the 2022-2024.

In the course of carrying out this study, four research questions were raised. Nine hundred respondents were involved in this study, and data on the social demographic factors of the respondents, the prevalence and outcome rates were assessed using a checklist that was designed by the researcher.

5.1.1 Prevalence of Malaria Infection

The findings from this study, shows that malaria was most prevalent in May and in the year 2023. This study equally revealed that malaria infection is most prevalent in females. This agrees with Tiedje et al, (2021) who found out that prevalence of malaria was high among children between 11-20 years and in wet season. This is in line with the findings of Afrane et al., 2021 which revealed that malaria infection is most prevalent in females.

5.1.2: Treatment Outcome of Malaria Infection

The findings of this study show that the treatment outcome of malaria infection had 95% success rate and 5% failure rate. This is in line with the findings of Afolabi et al., 2021 which reavealed 90.8%, with a failure rate of 9.2%..

5.2 Implication to Nursing Practice

The nursing practice trend towards health promotion will create opportunities for nurses to strengthen the profession's influence on health promotion through health education.

Nursing Practice: Nurses are in the unique position to enlighten these individuals, because they are always in contact with patients/client providing holistic care. For a nurse, to be able to give adequate information, she needs to have a thorough understanding on malaria, the effect on their health and measures to reduce occurence. Nurses should endeavour to health educate the parents of these children, as they have the right to this knowledge, which will enable them to make informed decisions on their health. This will help to promote positive health behaviors.

Nursing Education: This is what is hoped to be achieved at the end of the day. With good knowledge of malaria, nurses will be better informed to give proper information to clients. Nurses should be involved in giving health education to patients therefore emphasis must be laid on teaching patients of not treating malaria properly. Students should be involved in the process.

Research: In aspect of research, it increases the awareness of the severity of malaria infection and its researchability interest, by conducting more research to broaden their knowledge about malaria.

5.3 Limitation of the Study

The limitations of the study include:

1. Inadequate finance for the researcher to carry out an extensive research on the problem of study.

2. Shortage of time for the researcher to carry out an extensive research on the problem of study.

5.4 Summary

This study on the prevalence and outcome rates of this malaria infection in children below the age of 11 in University of Benin Teaching Hospital, Edo State from the 2022-2024 shows the introduction to the study which includes; the background of the study, statement of the problem, objectives of the study, research questions which assessed the prevalence of malaria infection, the treatment outcome and social demographic factors. The literature reviewed various works that have previously been carried out in various places concerning prevalence of malaria infection. It showed that malaria infection is a global health challenge.

The research methodology, which is a quantitative descriptive design. The data was collected with the use of checklist. Data was analyzed using frequency, percentages and were presented in tables where applicable. The prevalence of malaria infection is most prevalent in May, in the year 2023 and among females. Findings of the study were discussed using research questions and relationship with relevant literature reviewed was also carried out.

5.5 Conclusion

Malaria infection is a global health challenge, which remains prevalent in both developed and developing countries. The findings of this study, suggests that in order to achieve the optimum goal of improving health, measures to reduce the prevalence of malaria among children under 11 years should be considered. It is paramount that for effective strategies to be made, patients should be actively involved in the management of their health.

From the findings of thus research work, the researcher concluded that the treatment outcome of malaria infection has a high success rate.

5.6 Recommendation

The following recommendations are therefore suggested based on the findings of this study.

1. Health education by health personnel to enlighten parents on the dangers of malaria to health and ways of preventing it, as most people look up to their medical professionals for information and guidance.

2. Mass media outlets such as television, radio, road jingles and posters etc. should be used to disseminate useful information on malaria.

5.7 Suggestions for Further Studies

The researcher recommends that further research may be carried out in the following in another hospital in Benin City.

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APPENDIX

CHECKLIST

DATA EXTRACTION FORM

Topic: Prevalence and Outcome of Malaria Infection among Children Below 11 Years in a Tertiary Healthcare Facility in Benin City (2018–2020)

1. Study Identification

- **Title of Study/Record:** _____
- **Record Number/ID:** _____
- **Source of Data (e.g., hospital records, lab reports):** _____

2. Patient Demographic Details

- **Age (in years):** _____
- **Sex:** (Male / Female)
- **Residential Area (if available):** _____

3. Clinical Characteristics

- **Date of Diagnosis:** _____
- **Type of Malaria:** (e.g., uncomplicated, severe)
- **Diagnostic Method:** (e.g., RDT, microscopy)
- **Co-morbidities (if any):** _____

4. Treatment Details

- **Antimalarial Treatment Given:** _____
- **Supportive Treatment (if any):** _____

5. Outcome

- **Clinical Outcome:** (e.g., recovered, complications, mortality)
- **Duration of Hospital Stay (in days):** _____
- **Readmission (Yes/No):** _____

6. Additional Notes/Comments

- _____
- _____

7. Data Collector Details

- **Name of Data Extractor:** _____
- **Date of Data Extraction:** _____

Instructions:

- Complete all fields based on available records.
- Indicate "Not Available" (N/A) where information is missing.
- Ensure consistency in data abstraction across records.