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Women's Perceptions of Malaria in the Western Rural Areas of Sierra Leone

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2018

Abstract

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by

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MSN, University of Phoenix, 2011

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Malaria is one of the leading causes of death for children and women in Sierra Leone. The purpose of this qualitative study was to explore and understand the lived experiences of women from the rural areas of Sierra Leone regarding malaria. A purposive sample of Krio women from the western rural area, aged 21-55 years, spoke English, and had taken care of someone with malaria described their perceptions and lived experiences with the disease in face-to-face interviews. The research questions were based on the health belief model and focused on knowledge, beliefs, and perceptions about malaria prevention and treatment. Interpretative phenomenological analysis was used to identify themes through coding. The findings indicated that (a) lack of doctors, medicines, and medical supplies at government clinics discourages malaria victims from visiting those clinics; (b) the use of traditional herbs is prevalent because of their effectiveness, affordability, easy access, and lack of side effects; (c) women were not aware of recommended comprehensive malaria control measures, which include the continuous use of durable insecticide nets, residual spraying, case management, and artemisinin-based therapy. The results also show that (a) pregnant women should not take prescribed medications to prevent or treat malaria because they harm the fetus, and (b) traditional herbs may be taken with Western medicines to treat severe malaria. Recommendations include: that the government evaluate the efficiency and effectiveness of its current malaria programs in local clinics, and that future studies be undertaken to identify antimalarial properties in commonly accepted local herbs. Changes in policies and practices relating to the prevention and treatment of malaria will serve as building blocks for positive social change to reduce the malaria incidence rate in Sierra Leone.

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Dedication

This dissertation is dedicated to my deceased parents, Edward and Annette Davies, who instilled the value of education in me and laid the foundation for my educational growth. To my children, Olabisi and Babatunde, who tirelessly supported and encouraged me by upholding my educational pillars, I dedicate this dissertation to you. To the women of Sierra Leone, this dissertation is equally dedicated to you as we journey together in the fight to eradicate malaria in Sierra Leone.

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God is my refuge and strength. Like all my other educational journeys, my two beloved children, Olabisi and Babatunde, were on board with me. They always checked on me to ensure that I was still on board, providing prayers and words of encouragement. After every curve or road bump, they would check if I was still on board and reassured me of my unwavering strength. Other important people during this journey included my committee chair, Dr. Jeanne Connors; committee member, Dr. Michael Schwab; and URR member, Dr. Sriya Krishnamoorthy. These scholarly writers motivated and guided me through their recommendations so that I could become part of the elite club of philosophers. Special appreciation goes to the professors of the Walden University Health Science Department, who molded me over the years and helped to shape my research work. Also, I cannot forget the Walden writing and research centers for their active participation through this process to ensure that this research met all the standards set aside for Walden PhD graduates. A big thanks to Walden University for encouraging your students to become agents for social change.

To my deceased parents, Edward and Annette Davies, I am grateful for the values you imposed on me, reminding me that the sky is the limit and that I oversee my destination. To my siblings, who live in three different continents, thank you for your continued support, motivation, and encouragement during my entire educational journey. I am forever grateful to everyone, including my committee of friends who contributed to my success through prayers, thoughts, and deeds. The support of family and friends both near and far was invaluable, making this dissertation process a success. To God give the glory because, without His Grace, none of this would be possible.

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Chapter 1: Introduction

Background

Malaria is a curable and preventable disease caused by the *Anopheles* mosquito. The spread of malaria is caused when a mosquito infected with plasmodium bites an individual. There are five species of plasmodium causing human malaria: *P. vivax* (the most widespread), *P. falciparum* (found mainly in tropical and subtropical regions near the equator), *P. malariae*, *P, knowlesi*, and *P. ovale*. A bite from an infected female *Anopheles* mosquito may have an incubation period lasting from 7 to 30 days, depending on the immune system of the individual (Centers for Disease Control and Prevention [CDC], 2007). Shorter incubation periods are experienced with *P. falciparum*, and longer periods are experienced with *P. malariae* (CDC, 2007). *P. falciparum* produces the most severe symptoms. Infection with malaria parasites may result in a variety of symptoms, ranging from mild symptoms to severe disease and even death (CDC, 2007). For uncomplicated malaria, symptoms include fever, chills, sweats, headaches, nausea and vomiting, body aches, and general malaise. Severe malaria is complicated by organ failures and other abnormalities, which can be manifested in cerebral malaria, coma, severe anemia, hemoglobinuria, acute respiratory distress syndrome (ARDS), low blood pressure, acute kidney failure, and other metabolic complications (CDC, 2004). Furthermore, while the symptoms of uncomplicated malaria are recognizable, the complications of severe malaria are often unrecognized and can lead to organ failure and death (Strode et al., 2014). Supported by evidence-based research, the use of insecticide-treated nets (ITNs) has been promoted by public health officials as a significant approach

to reduce the incidence of malaria (Loll et al., 2014). However, sluggish progress in the reduction of malaria cases and malaria complications in many African countries poses a challenge for public health officials (Arori, 2011) Implementation of preventive measures is a critical factor to reduce malaria incidence in Africa.

Impact of Malaria

Malaria is a long-standing health problem with high morbidity and mortality rates in many sub-Saharan African (SSA) countries. Per the World Health Organization (WHO, 2013) and the CDC (2015), 3.2 billion people live in areas at risk of malaria transmission in 106 countries and territories. Malaria is highly prevalent in poor tropical areas of the world, making it a leading cause of illness and death (Nsimba & Kayombo, 2008). The most vulnerable are young children with low immunity to the disease and pregnant women whose immunity has been compromised by their pregnancy. In 2013, an estimated 90% of all malaria deaths occurred in Africa, of which 430,000 deaths were in children under the age of 5 years (Nilsson, Childs, Buckee, & Marti, 2015). As a major disease in poor developing countries, it was the fourth highest cause of death in SSA, killing a child every 2 minutes (Goldberg, 2012). Today, Africa carries the largest burden of malaria and continues to face challenges in controlling the disease despite efforts from major international organizations. The impact of malaria on health care systems in many malaria-endemic regions is evidenced in a high rate of outpatient-clinic visits for malaria (De Castro & Fisher, 2012). Additionally, almost 50% of all hospital admissions and inpatient deaths are malaria-related cases because of late presentation and unavailability of effective drugs and health care providers (De Castro & Fisher, 2012). Amongst the

poor, the impact of malaria is significant because they are unable to afford preventive measures or appropriate treatments for the disease and may lack access to treatment facilities (Ricci, 2013). Considered as a cause and a consequence of poverty, malaria prevalence remains high in many SSA countries, with people living in a cycle of poverty and poor health (Loll et al., 2014).

Social and Economic Toll of Malaria

The economic effects of malaria are noted in current literature. The disease is a cause of poverty with direct costs involving a combination of private and public expenditures, as well as indirect costs through lost productivity constraining economic development (Ricci, 2013; Sonko et al., 2014). Today, malaria risks remain geographically specific, with endemic rates confined to poor tropical and subtropical regions where economic growth has been dismal (CDC, 2015; WHO, 2013). The economic toll of malaria is high on health care systems and individual households, impeding economic development in countries with malaria endemic rates. Government costs include loss of income resulting from lost days of work, lost opportunities for economic ventures and international trade and tourism, costs of public health interventions, costs to purchase drugs and supplies, and costs to staff health care facilities (Andrews, Lynch, Eckert, & Gutman, 2015). Costs to families and individuals include those associated with preventive measures such as ITNs, medications, treatments, lost days of work, lost days of school, transportation to clinics, and funeral expenses (Andrews et al., 2015; Nsimba & Kayombo, 2008). The WHO estimated the direct cost of malaria for countries with endemic malaria rates to be approximately US$12 billion

annually, noting that malaria reduced the growth of their gross domestic product (GDP) by 1.3% per year (WHO, 2015). Current literature (Ricci, 2013) clearly suggests that malaria has tremendous economic effects on countries with intense transmission, causing a drag on economic growth. Ricci (2013) expanded the economic burden of malaria in Africa to encompass the loss of human resources due to premature childhood deaths, interruptions in schooling, and neurological and other long-term health damage from severe malaria. The presence of malaria in African continues hampers national prosperity because of social and economic conditions (Andrews et al., 2015). Furthermore, the microeconomic effects of other household members caring for malaria victims remain uncertain (Ricci, 2013). Evidence shows that illness from malaria prevents household members from completing their normal productive duties while caring for the sick, resulting in decreased household productivity and loss of income productivity (Russel, 2014).

Problem Statement

Malaria is a significant health problem in many SSA countries despite initiatives that have been put in place to address the problem within this region (WHO, 2013). Records from the CDC and the WHO indicate that 90% of malaria fatalities take place in SSA (CDC, 2015; WHO, 2013). In 2012, malaria caused an estimated 207 million clinical episodes and 627,000 deaths (CDC, 2015; WHO, 2013), with an estimated 91% of malaria-related deaths occurring in the African region (CDC, 2015). In 2010, malaria was ranked as the fourth leading cause of death in children in developing countries (Black et al., 2010). Among adults, malaria is the second-leading cause of death from

infectious diseases after HIV/AIDS (Black et al., 2010). In 2010, the world experienced a high prevalence of malaria, with the disease resulting in approximately 216 million cases and causing 655,000 deaths (Andrew et al., 2015). Factors such as increased exposure to the disease, increased resistance to antimalaria drugs, stagnation with interventions, insufficient health services, and the climate of the continent contribute to the magnitude of the disease's presence in Africa (Ricci, 2013). Moreover, about 50 million women living in malaria-endemic countries in SSA become pregnant with malaria, which poses many health risks for the mother and the baby (Andrews et al.,2015; Muty & Arora, 2007; Silal et al., 2012). Malaria-infected pregnant women in high transmission areas can experience miscarriage during the initial stages of pregnancies; infection may also result in the delivery of a low birth weight infant or maternal death (Silal et al., 2012).

In many SSA countries, the challenges of malaria control are compounded by social and environmental conditions of poverty, disadvantaged communities, and weak health systems (Andrews et al., 2015; Mwanje & Comm, 2013; Silal et al., 2012). With globalization, migrations of people, wars, importation and exportation of disease, and climate and environmental changes, the scale of the malaria problem is rising in SSA countries (Singh, Musa, Singh, & Ebere, 2014; Williams, Martina, Cumming, & Hall, 2009). In postwar Sierra Leone, the inadequate capacity for malaria control is compounded by weak health systems and displacements of people, creating an obstacle to effective malaria control (Andrews et al., 2015). Public health research can contribute to the development of health policies on disease prevention and a decline in morbidity and

mortality rates (Soriano, 2013). It is important to reduce morbidity and mortality rates for malaria in rural regions in Africa to improve health outcomes.

Although there have been many prevalence studies of malaria morbidity and mortality rates in Africa (Houngbedji et al., 2015), little research has been conducted on the perceptions of women who live in malaria-endemic communities, concerning their knowledge of the disease, their perception of treatments, and prevention. From a quantitative cross-sectional study, Hougbedji et al. (2015) noted 214 million cases of malaria worldwide in 2015, reporting 438,000 deaths and a child dying every 2 minutes from malaria in SSA. It was also reported that Ethiopia accounted for 90% of malaria infections from *Plasmodium falciparum* in 2013 (Nsimba & Kayombo, 2016). The magnitude of this threatening infectious disease is most apparent in Africa, where eradication of the problem is compounded by social, environmental, and political factors (Thiam et al., 2013; WHO, 2016). Efforts to fill in the gap in the literature about women's perceptions of the disease are necessary to enhance the body of knowledge on this phenomenon. Information from research can be used to promote awareness and enhance initiatives that will improve population health outcomes and promote social change.

Purpose

The purpose of this study was to explore and describe the lived experiences of women with malaria and the factors that influence their decisions on malaria prevention and treatment measures. Given the current makeup of rural Sierra Leone, any knowledge about the perceptions of women from postwar rural areas of Sierra Leone will contribute

to the body of knowledge to guide the allocation and implementation of health programs and policies to effect social change. To support changes in health behaviors, it is necessary to understand the culture, beliefs, and norms that guide health behavior. According to Sachs and Malaney (2012), if actions are to be effective in the prevention of diseases and in the promotion of health and well-being, they must be based on an understanding of culture, tradition, beliefs, and patterns of family interaction (p. 4).

As Glanz et al. (2015) pointed out, an individual's sociocultural environment serves as a set of determinants of health behavior and health outcomes. Addressing malaria prevention, Govoetchan et al. (2014) identified environmental conditions of high humidity, tropical settings, economic capacity, and lack of education as precursors to high malaria prevalence in Africa. Likewise, Ricci (2013) suggested that malaria control strategies include massive education and awareness of disease symptoms and treatment measures, as well as indoor and outdoor spraying, ITN use, and economic capacity building. For this study, participants shared their knowledge of the disease, along with aspects of their culture, traditions, and norms that influenced their approach to the disease. Mwanje and Comm (2013) emphasized the importance of addressing women's health in Africa by targeting domains such as malaria control among pregnant women. Understanding the perceptions of malaria victims and their influence on health behavior is important to increase awareness of the problem and promote early diagnosis and treatment (Boene et al., 2014). The experiences shared by the study participants will be disseminated to public health stakeholders, who can tailor and target malaria programs to the needs of the participants.

Theoretical Framework

The health belief model (HBM) was applied in this qualitative study to guide the data collection and analysis process. The HBM developed by Rosenstock, Hochbaum, and Kegels in the 1950s was one of the first theories of health behavior, and it remains one of the most widely recognized theories in the field. The original authors of the theory described the constructs of perceived susceptibility, perceived severity, perceived benefits and threats, barriers, cues to action, and self-efficacy as factors that determine human behavior (Rosenstock, 1974). These constructs are subjective beliefs that guide individuals' decisions on health behavior. In other studies, Glanz et al. (2015) and Kelly (2010) highlighted how culture, traditions, and religious norms create barriers to malaria treatment. In addition to exploring behavior, individual-level theories such as the HBM focus on intrapersonal factors (those existing or occurring within the individual self or mind). Intrapersonal factors include knowledge, attitudes, beliefs, motivation, self-concept, developmental history, past experiences, and skills. This theory is described further in Chapter 2.

Research Questions

The research questions for this study were the following:

RQ1: What is the experience of women with malaria?

RQ2: What do the women of the rural areas of Sierra Leone know about causes and treatments for malaria?

RQ3: What are the perceptions of these women about the social and cultural beliefs, traditions, norms, and religious affiliations that influence the local treatment and prevention of malaria?

Nature of the Study

Through this qualitative phenomenological study, women from the Western rural areas of Sierra Leone had the opportunity to describe their perceptions of malaria, its treatment, prevention measures, and their views on the disease. According to Creswell (2013), the operative word in phenomenological research is *describe*, with the researcher focusing on describing as accurately as possible the phenomenon, refraining from any pregiven framework. A purposive sampling approach was appropriate for this study. With this type of nonprobability sampling, researchers can recruit study participants, in a nonrandom manner, who represent a population based on the purpose of the study (Crosby, DiClemente, & Salazar, 2013). The participants met certain characteristics specific to the purpose of the study. For this study, participants were recruited from a small village located in the Western rural area of Sierra Leone, close to Freetown, the country's capital. Through semi structured, open-ended interviews, participants from this rural village in Sierra Leone shared their experiences, knowledge, cultural beliefs, and treatment approaches in relation to the disease. By telling stories, silent voices can share life experiences that can impact health policies and public health outcomes (Creswell, 2013). Addressing health factors of different population groups can provide information to guide public health officials to understand the impact of socioeconomic conditions on health outcomes.

Eligible participants included women who knew someone who had suffered from malaria or had taken care of malaria victims. The questionnaire consisted of 32 questions divided into five distinct categories: culture-related questions, religious questions, perceptions, knowledge-related questions, and questions about personal views of the disease. The responses were organized using NVivo 10 to categorize concepts into themes. The theory of HBM guided the findings of the study.

Definition of Terms

For this qualitative inductive study, there are terms that require clarification.

Agbo: A mixture of herbs with healing properties used to treat malaria.

Ageeree: A type of local herb used to treat malaria.

Anopheles mosquitoes: The primary vector for malaria, also known as *malaria mosquitoes* (WHO, 2013).

Acute respiratory distress syndrome (ARDS): An inflammatory reaction in the lungs that inhibits oxygen exchange, which may occur with high parasite counts in the blood.

Broomstone: A type of local herb used to treat malaria.

Hemoglobinuria: The presence of an abnormally high amount of red blood cells in urine.

Herbalist: A traditional healer who specializes in malaria treatment using herbs.

Krio: A local language mainly spoken in the Western area of Sierra Leone. This is the original language of the Creole tribe.

Malaria: An infectious disease caused by a single-cell plasmodia parasite from the bite of an *Anopheles* mosquito.

Pee: Urinate.

Plasmodium: A protozoan parasite that causes malaria (WHO, 2013).

Poverty: For this study, *poverty* refers to lack of money with less than $1 per day for living allowance.

Private lessons: Private tutoring.

Provincial cities: The cities outside the capital of Freetown. Sierra Leone has 14 districts, with the capital located in the western area of the country, which is considered the Western area urban district.

Rural areas: Geographical areas that are not within a town or city.

Slum: For this study, *slum* refers to an area with deteriorating living conditions.

Sweat: To fumigate with herbal mixtures.

Traditional healer: Per the WHO (2008), a *traditional healer* is a person with numerous social and cultural experiences and is recognized by the community as competent to provide health care services using herbs.

Utilization: For this study, *utilization* refers to accessing and using health care services.

Assumptions, Scope, and Limitations

Assumptions

There were several philosophical assumptions in this phenomenological study as I explored and described the lived experiences of women on malaria. By establishing trust

with the study participants, I assumed that the participants were willing to share their perceptions and experiences about the disease. I also assumed that the women were willing to report accurately and truthfully their perceptions of malaria and their treatment approaches. From the purposive sampling approach, there was the assumption that the study participants represented the criteria identified in the recruitment flyer. There was the assumption that the research was bounded by the context and was based on an inductive form of logic. In the semi structured, open-ended interview questions, I assumed that the participants provided pertinent information to describe the phenomenon. Furthermore, I assumed that the information uncovered would generate themes to explain the phenomenon and answer the research questions. As I was part of the research instrument, it was my assumption that manipulation of the data collection and analysis process would ensure theoretical saturation.

Scope

The research problem was focused on the perceptions of women on malaria as they described their traditions, beliefs, and knowledge about the disease. The scope of this study was limited to the residents of a village in the western rural area of Sierra Leone. Residents of the village represent a few tribes, with the predominant tribe being the Krio. The main sources of income are local commerce, trade from small neighborhood shops, and local farming. Tribal customs and beliefs influence health behaviors (Singh et al., 2014), and the participants were from the Krio tribe, whose members were predominant among residents in the village. The scope of the study did not include women of other tribes.

Limitations

The specific population of the study was a limitation. The study sample was limited to a small geographical area in Sierra Leone. An additional limitation was posed by the selection process for the participants. Participants were selected from volunteers who responded to flyers. Findings from this study may be relevant to other areas that experience high rates of malaria with similar environments and economic contexts. Information from this study is specific to malaria, making it difficult to generalize it to other diseases with similar symptoms. Additionally, asking the study participants to provide information from memory may have led to recall bias. Self-reporting of data from memory can threaten the internal validity of a study when introduced in the data collection process (Creswell, 2013). Efforts to minimize recall bias were taken by paying special attention to the wording of the interview questions to minimize or eliminate challenges posed by memory.

Significance of the Study

This study is significant in filling gaps in the literature concerning perceptions and beliefs about malaria held by women, especially in rural areas of postwar Sierra Leone. This information significantly enhances the body of knowledge about the phenomenon being studied while contributing to social change. Reports from the WHO (2013) show that over 40% of the world's population live in malaria endemic regions and over 50% of the population of Sierra Leone live in rural areas. Sierra Leone is a malaria-infested country whose people are struggling to combat the challenges of rebuilding a health system to address increasing morbidity and mortality rates for infectious diseases such as

malaria, HIV-AIDS, and other childhood diseases (Jain, Brown, & Johnson, 2015). Consequently, the rural areas of postwar Sierra Leone present a unique setting that was appropriate for this study. This study provides an opportunity to address the social determinants of health that encompasses individual perceptions and beliefs. To generate health initiatives to improve malaria outcomes, it is necessary to understand the socioeconomic conditions, culture, traditional norms, experiences, and attitudes of the identified participants. Additionally, this study provided an opportunity to enhance the body of knowledge about the phenomenon by describing women's perceptions of the disease. Exploring women's knowledge about the disease may stimulate policy development and implementation of strategies to accelerate progress with malaria initiatives (Mwanje & Comm, 2013).

Furthermore, with human migration, political unrest, and wars, the treatment costs associated with malaria pose a huge burden for local and international governments (Mwanje & Comm, 2013; Singh et al., 2014; Williams, et al., 2009). There is abundant information about the appropriate use and applications of current malaria initiatives, with less emphasis on the knowledge and perceptions of malaria victims (Andrews et al., 2015; Baume & Marin, 2011; Mwanje & Comm, 2013).

Implications for Social Change

After the 10-year civil war in Sierra Leone that ended in 2000, many people were displaced, causing a change in the demographic makeup of various regions, especially in the Western region of the country (SSL, 2006b). In 2015, the postwar economically deprived country experienced an epidemic of Ebola, which compounded the existing

malaria problem. This study provides information that could be used to evaluate the effectiveness of existing malaria programs and guide the development of programs or policies. Public health interventions and policies on malaria are channels for social change. Social change initiatives encompass evidence-based research that addresses the social determinants of health (Holmes, Slifkin, Randolph, & Poley, 2015). Current research suggests that economic, environmental, and social forces are determinants of many diseases and of behaviors that contribute to health interventions (Holmes et al., 2015). Information provided through this research could lead to health education aimed mainly at changing individual behavior and lifestyle to effect positive health behaviors that lead to social change (Dodman & Mitlin, 2013). Identifying and understanding the factors that influence health behaviors and disease treatments in rural Sierra Leone may provide an alternative way to understand social, historical, cultural, environmental, and traditional approaches to malaria prevention and treatment. For social change to take place, it is necessary to understand the factors that motivate individuals to modify their behaviors and the interplay of health determinants at various levels (Kegan & Lahey, 2014).

Summary

This chapter provided an overview of the study by outlining the purpose of the study, problem statement, theoretical framework, research questions, background of the problem, and significance of the study. The chapter outlined aspects of malaria, revealing that malaria remains a significant cause for high morbidity and mortality rates for pregnant women and children under the age of 5 in many tropical countries, including

Sierra Leone. The economic burden of malaria indicated in the chapter is experienced at the individual and government levels, as indicated by high health care costs and slow economic growth. This chapter also provided implications for social change and health behaviors.

Chapter 2 highlights historical aspects of the disease and a review of the literature that supports the tenets outlined in Chapter 1. In Chapter 3, I discuss the design and methodology of the study, with the detailed results of the study discussed in Chapter 4. The findings of the study are discussed in Chapter 5, which includes interpretations of the results, the limitations of the study, recommendations for future research, and expansion on implications for social change.

Chapter 2: Literature Review

Introduction

High morbidity and mortality rates for malaria among women in Africa are a public health concern. To explore the perceptions of women on malaria, I conducted a review of the literature to identify gaps related to perceptions of malaria victims on treatment and prevention of malaria. In this review, I explored and described historical aspects of the disease, its epidemiology, current treatment measures, general beliefs, traditions, norms about malaria, and other factors that influence malaria outcomes in Africa. Intrinsic and extrinsic factors that impact healthcare-seeking behaviors were examined to understand how women from rural areas of Sierra Leone seek malaria treatments.

Areas covered in this study included historical aspects of malaria; the impact of malaria in Africa; the epidemiology of malaria; barriers to healthcare; economic burden and social problems related to malaria; wealth inequality and health coverage; vulnerable populations; knowledge, attitudes, and practices related to malaria prevention; and evidence-based public health initiatives for malaria. These highlighted areas are essential in building a comprehensive framework to explore women's perceptions of malaria and their beliefs and knowledge about the disease and its treatment.

Literature Search Strategy

My efforts to research and review literature for this study were effective and inexpensive because of Internet technology. Many private and public research databases are available online. I conducted the search using databases from the Walden University

Library and the University of Phoenix Library. I used PubMed, a publicly available online database which is fed by MEDLINE, ProQuest, and CINAHL. Other references included reports from the CDC, UNICEF, and WHO, as well as statistical reports from Sierra Leone. The search criteria encompassed peer-reviewed articles and articles published between 2010 and 2017. Search terms included *malaria*, *malaria in Sierra Leone*, *malaria in Africa*, *malaria prevention methods*, *malaria control in Africa*, *malaria awareness in Africa*, *ITN for malaria treatments*, and *malaria efforts in Africa*. Review of malaria journals and public health journals was also conducted.

Theoretical Framework

For the study, the health belief model (HBM) guided the research questions and analysis of the information. The HBM was developed in the 1950s by social psychologists Irwin Rosenstock, Godfrey Hochbaum, and Stephen Kegels while working at the U.S. Public Health Service (Rosenstock, 1974). In response to poor turnout for free tuberculosis (TB) screening, these psychologists studied the reasons for the poor turnout and noted that individual health behavior was influenced by a person's beliefs and perceptions about a disease; this idea formed the foundation for the HBM (Glanz et al., 2015). These researchers categorized those perceptions into constructs of perceived susceptibility, perceived severity, perceived benefit, perceived barriers, cues to action, and self-efficacy (Glanz et al., 2015). In relation to perceived susceptibility, individuals can adjust their health behavior to prevent the possibility of being exposed to malaria by using ITNs. In relation to perceived severity, an individual might take actions to avoid the seriousness of the disease by staying away from someone with malaria or addressing

malaria symptoms at their onset. With perceived benefits, individuals may make health care decisions because of the potential advantages. For example, a malaria victim may visit a health clinic with the intent of gaining something from the clinic that will help with the disease. With perceived barriers, malaria victims may delay seeking treatments because of financial constraints, distance to clinics, or traditions. Cues to action can be observed when malaria victims are forced to act because of high fever or poor appetite. Self-efficacy pertains to an individual's self determination to take action that will lead to behavior change. For a malaria victim, disease awareness and knowledge can direct behavior concerning the disease.

The HBM remains one of the theories widely used in social sciences. In 2013, Mwange (2013) applied the HBM to describe the attitudes, knowledge, and practices of local communities in Uganda about malaria. The researcher noted that age, poverty, traditions, and beliefs were associated with malaria practices. Likewise, Adeneye et al. (2013) and Appiah-Darkwah and Badu-Nyarko (2011) applied the HBM to describe community perceptions of malaria in Nigeria and knowledge of malaria prevention and control in Ghana, with finance identified as a major barrier. Applying the HBM to describe women's perceptions of malaria in the western rural areas of Sierra Leone produced significant information to fill the current knowledge gap about the perceptions of malaria victims on prevention and treatment. Through application of the constructs of the HBM, data were collected that could guide policy development and initiatives that may lead to improvement in health outcomes.

Literature Review Related to Malaria

Historical Aspects of Malaria

In 2700 BC, malaria symptoms were outlined in the Chinese medical writing known as the Nei Ching. These symptoms were later recognized in Greece in the 4th century BC as the cause of the decline in the state's population (Zhou, Wang, & Xia, 2013) Many Roman writers attributed the symptoms to bites from a certain insect from swamp areas. During the second century BCE, the Chinese described the Qinghao plant and 52 other remedies for malaria (Nicolas et al., 2007). In 1971, Chinese scientists isolated the active ingredient of Qinghao, recognizing it for its antifever properties; it is known today as *artemisinin*, an effective malaria medication (Nicolas et al., 2007). In the early 17th century, Spanish Jesuit missionaries used medicinal bark from trees used by indigenous Indians to treat fevers. The medicine from these tree barks is now known as *quinine*, one of the most effective antimalarial medications today (Nicolas et al., 2007). With the evolution of malaria treatments, malaria policy in Sierra Leone recommends the use of quinine for severe malaria.

Malaria in Africa

The mosquito-borne disease malaria is preventable; however, it remains a profound health problem in many African nations (Mwanje & Comm, 2013; Silal et al., 2012). Factors such as massive population movements due to wars and political unrest, unsustained funding from donor countries, intensified insecticide resistance, and climate change inhibit malaria control efforts in the region, making them ineffective (Gatton et al.,2013). Vector control plays a significant role in malaria control. However, the

progress made in malaria control has been stalled, requiring alternate initiatives and strategies with regard to eradication efforts in Africa (Gatton et al., 2013). With the resurgence of malaria incidence and to sustain the progress of the last decade, increased national and international efforts toward new delivery tools are necessary to promote integrated vector management initiatives (Gatton et al., 2013).

Malaria Prevalence in Africa

The prevalence of malaria among pregnant women and young children is underestimated because of poor reporting and record keeping (Van Eijk, Hill, Noor, Snow, & O ter Kuile, 2015). From a cross-sectional survey in 2015, Ceesay et al. (2015) reported a high prevalence of malaria among infants below 6 months in Guinea (21.7%), The Gambia (11.8%), and Benin (10.2%). Malaria in infants was primarily associated with anemia and fever (Ceesay et al., 2015). For new babies, protection against malaria is for a brief period with an increased risk for malaria within the first six months of life (Ceesay et al., 2015). Among pregnant women, a high prevalence of malaria exists among those attending antenatal clinics presenting with sexually transmitted disease (Mathew et al., 2012). This report correlates with the high prevalence rate in children derived from household surveys (Van Eijk et al., 2015).

In 2012, malaria was responsible for approximately 584,000 deaths, 367,000 of which were children in Africa (WHO, 2013). In 2015, the world experienced an estimated 214 million episodes of malaria, with 438,000 deaths, 90% of which occurred in SSA (CDC, 2015). Reports from the WHO revealed that approximately 207 million

cases of malaria are reported yearly, with 90% of malaria fatalities taking place in SSA each year and almost 1,300 childhood malaria deaths daily (WHO, 2013).

The rural regions of Sierra Leone are subject to malaria devastation due to lack of adequate resources for malaria treatment. As in many SSA countries, malaria is a significant health problem in Sierra Leone, followed by HIV/AIDS, tuberculosis, acute respiratory infections, childhood immunization diseases, and nutritional problems (SLL, 2005). In many African countries, the economic burden of malaria is experienced through lost days of work and school, premature deaths, high medical expenses, and stagnation in economic growth (Magadi et al., 2003; Muty & Arora, 2007; Thiam et al., 2013).

The Vulnerable Population

Reports from the WHO and the CDC show that majority of the world's maternal mortality rate is experienced in SSA, where the malaria mortality rate remains high (CDC, 2015; WHO, 2013). Pregnant women and children under the age of 5 are most vulnerable to malaria because of little immunity to the disease (WHO, 2013). In 2012, Silal et al. described malaria's impact on a rural community in Uganda, indicating that women and young children are part of the disadvantaged population experiencing a high prevalence rate of malaria. Akazili (2002) and Antwi and Marfo (2008) also identified malaria as the leading cause of childhood mortalities among young children in Ghana. While children and pregnant women are highly vulnerable to the disease, individuals with low immunity such as those with infectious diseases, the elderly, and individuals traveling to regions where malaria transmission is intense are also vulnerable.

In a favorable tropical climate such as that found in swamp areas, *Anopheles* mosquitos can breed easily, increasing the transmittal of the parasite. The ecological conditions of many African countries, with heavy rainfalls and seasonal flooding, foster favorable conditions for malaria transmission year-round (Mitiku et al., 2016). The remoteness of some rural areas and farm settlements are health barriers that result in poor access to malaria prevention and treatments (Mitiku et al., 2016). People living in remote rural areas and swamp regions that are removed from health facilities are equally highly vulnerable to the disease. The disease is the major cause of poor development in children in Sierra Leone and accounts for a childhood mortality rate of 30% for children under 5 (Jain et al., 2015).

It is also noted that those in rural settings are more prone to malaria as they live in poor socioeconomic conditions and unclean environments that are conducive to breeding mosquitos. Silal et al. (2012) asserted that the socioeconomic conditions of people living in rural areas in Africa contribute to the financial constraints that hinder engagement in malaria prevention measures. In postwar Sierra Leone, the rise in the population in rural areas poses an additional economic burden on the existing limited health resources in the region.

Malaria Prevention

Intermittent preventive treatment in pregnancy (IPTp), ITNs, and sulfadoxine-pyrimentamine (SP) are promoted as effective treatments for malaria. Nonetheless, the use of IPTp and SP among pregnant women is unacceptably low because of low patient adherence and practices and attitudes of health professionals. In Malawi, it is reported

that local taboos prohibit the consumption of bitter substances during pregnancy, posing limitations to the acceptance of antimalarial drugs such as IPTp (Uskel et al., 2009). In a study on the perceptions of malaria in a rural village in Ghana, malaria was not considered a threat to pregnancy, and participants were unaware of the impact of malaria on pregnancy and birth outcomes (Andrews, Lynch, Eckert, & Gutman, 2015). In some cases, the use of malaria prevention drugs in pregnancy has been limited because of the notion that such drugs cause miscarriage or difficult labor (Thiam, Kimotho, & Gatonga, 2013). Anders et al. (2014) shared that women in Tanzania delayed their visits to antenatal clinics or did not return for follow-up visits to avoid receiving SP, thinking that malaria-preventive treatments during pregnancy might lead to premature labor or abortion. Similarly, to prevent premature delivery, women made their first antenatal care visit before 16 weeks to avoid receiving SP and did not return for the first dose of SP until after the recommended time (Anchang-Kimbi et al., 2014).

ITNs for Malaria Prevention

Evidence that ITN use has proven to be a cost-effective and successful measure to curb the negative impact of malaria has been demonstrated by many researchers. For several years, studies have shown that the use of ITNs has reduced the prevalence of malaria for many nations (WHO, 2013). ITNs are bed nets treated with an insecticide that repels and kills mosquitoes, reducing the number that feed on people (CDC, n.d.). As a form of personal protection, the use of ITNs has been proven to reduce the prevalence of malaria by reducing malaria morbidity and mortality in endemic regions (Williams et al., 2009). Many community-wide trials in African settings have revealed that the use of

ITNs has significantly impacted the death rate from malaria for children under the age of 5 (WHO, 2013). In areas with stable malaria, the use of ITNs provides protection against malaria of up to 60% and reduces the incidence of uncomplicated malarial episodes by 50% (Rowe et al., 2009). Furthermore, ITNs have been shown to reduce the transmission of malaria by reducing the mosquito population and reducing under-5 childhood mortality due to all causes (Rowe et al., 2009). In the "Roll Back Malaria" (RBM) initiatives of Ghana and Kenya, ITNs were distributed to 20% and 25 % of children below 5 years, strengthening health services and making effective prevention and treatments widely available (Antwi & Marfo, 2008). The need to re-treat nets has been eliminated using innovative technology, making the insecticidal nets long-lasting and effective for up to 5 years (Antwi & Marfo, 2008). The evidence of the impact of ITNs on public health outcomes has supported the wide-scale use of the product in malaria endemic regions in Africa (UNICEF, 2012; WHO, 2013). Information from the study shed light on women's knowledge about ITNs and other malaria prevention and treatment measures.

Contributing Factors for Malaria

Barriers to Health Care

Barriers to health in many SSA countries create bottlenecks in the delivery of services to vulnerable and disadvantaged populations that are experiencing high prevalence of malaria. The significance of lack of access to health, and the devastating outcomes on disease prevalence and women's health have created a lag in achieving global health outcomes (WHO, 2013). In their writings, Silal et al. (2012); Magadi, Zulu,

and Brockerhoff (2003); and Uwimana, Jackson, Hausler, and Zarowsky (2012) pointed out that lack of access to antenatal care increases the risk of maternal mortality, pre-eclampsia, and premature delivery. Other barriers to health care include the inadequate provision of health clinics in rural areas, shortage of health care providers, the geographical location of health services, the distance to clinics, and financial constraints (Silal et al., 2012; Uwimana et al., 2012). Although ITNs and IPTp are proven measures recommended by the WHO, Hill et al. (2013), Uwimana et al., and Thiam et al. affirmed the notion that the use of such measures is hindered by weaknesses in local and national healthcare systems, unclear health policies, and lack of knowledge and training. Additionally, Thiam et al. argued that poor leadership, lack of guidelines, poor accountability, inadequate financing, and exorbitant cost prevented women from securing antenatal services that included IPTp to prevent malaria in pregnancy. Hill et al. confirmed that individual barriers were rooted in a lack of knowledge of available treatments or benefits of treatments. Economic and other system barriers were identified as women being denied treatment or asked to pay for additional treatments. Study findings from Hill et al. and William et al. (2009) correlate with existing studies on factors affecting delivery of and access to health care in SSA. These studies outline existing health system barriers such as socioeconomic status, the financial burden of malaria, and employment status as important predictors of women's health outcomes.

With respect to malaria control programs in SSA, lack of proper coordination, leadership, and facilitation of local networks to promote the uptake and implementation of policies on IPTp poses a significant problem (Uwimana et al., 2012). Additionally, the

hierarchy and the ranking system of local health systems contribute to power relations that affect the performance of health care providers. Although the use of ITNs is widely promoted by health officials in Sierra Leone, it is also noted that lack of leadership, improper allocation of resources, and shortages of healthcare workers are among the challenges that impede malaria control (Jain et al., 2015). Knowing malaria victims' challenges, obstacles, and perceptions of the disease is necessary to advance malaria initiatives in the rural areas of Sierra Leone.

Poverty and Malaria

Malaria has been identified as one of the causes of poverty in many SSA countries, costing local economies billions of dollars a year (Teklehaimanot & Mejia, 2012). Economists claim that poverty is a significant determinant of malaria, with the disease being a contributing factor to poverty (Somi, Butler, & Vahid, 2014). The severity of the disease burden is also noted to be in the poorest nations of the world where malaria-eradication efforts are compromised by underdeveloped health systems (Somi et al., 2014). Though the disease can affect everyone, the socially deprived and the poor experience worse outcomes. Undoubtedly, the impact of the disease continues to have an economic toll on those who are poor and cannot afford preventive or treatment measures (Tusting, 2016**)**). The complex correlation between malaria and poverty creates a condition for malaria to thrive and sustain a vicious cycle of poor health in poor communities (Tusting, 2016). In 1999, it was estimated that 57.9% of the world malaria-deaths were from 20% of the world's poorest nations (Teklehaimanot & Mejia, 2012). In 2012, malaria-related deaths among children in Tanzania was 39% higher among the

poorest than among the least poor (Somi et al., 2014). In poor developing countries, it was estimated that 35% of individuals in the poor category were two times less likely to receive malaria treatments from local clinics (Tusting, 2016). In Ghana, the upper west region with a monthly household income of less than $1 a day experience one of the worst outcomes from malaria (Nyarko & Cobblah, 2014). Likewise, in Nigeria, individuals with daily income less than $1 a day did not use ITNs or preventive measures toward malaria and were reported to suffer from severe malaria (Stratton, O'Neill, Kruk, & Bell, 2013). Household poverty has a direct correlation to morbidity because of the impeded ability to invest in malaria preventive measures (Stratton et al., 2013). The poor in the rural regions in Africa experience financial and geographical barriers to malaria treatments because they live far from malaria clinics with limited access to transportation (Teklehaimanot & Mejia, 2012). It is no doubt that malaria control requires poverty reduction strategies especially for poor communities that cannot protect themselves or finance control measures (Teklehaimanot & Mejia, 2012).

Economic Burden and Social Problems Related to Malaria

Researchers have established a close connection between malaria, poverty, low economic growth in malaria endemic regions. The argument has been that poverty is a significant contributor to malaria, with devastating outcomes to individuals and nations (Uwimana et al., 2012). In 2009, Williams et al. (2009) shared their study results which indicated that families from rural communities in Uganda were challenged with choosing between spending scarce resources on malaria treatments or other living expenses. This information is echoed by Hill et al. (2013) whose research findings indicated that

purchasing ITNs was not a priority for struggling families. From surveys conducted in a rural town in Uganda, the authors noted that malaria was the major cause of morbidity and mortality within the community, with almost 34% of household's income allocated to malaria treatment (Williams, et al., 2009).

Furthermore, the exorbitant cost of healthcare prohibits individuals to seek health services (WHO, 2013). From a cross-sectional study conducted in a village in Uganda, the authors revealed that families spent almost 30% of their income on malaria treatment and prevention (Hosseinpoor, Victora, Bergen, Barros, & Boerma, 2011). Malaria-afflicted families could only harvest 40% of crops harvested by healthy families because of sick days from malaria experienced by family members (Hosseinpoor et al., 2011). Analyzed data from 28 African countries on wealth-related inequalities revealed that malaria-endemic countries constitute the world's most impoverished nations (Hosseinpoor et al., 2011). Approximately 60% of children's schooling could be interrupted because of multiple exposures to malaria (Akazili, 2002). In many African countries, the cost of malaria control and treatment continues to slow economic growth by approximately 1.3 % a year (Akazili, 2002).

At the national level, the problem of malaria affects tourism, posing a drag in the economy. Many African governments cannot afford the large financial cost necessary for adequate malaria control (WHO, 2013). The lack of healthcare providers, inadequate supplies, and shortages of medications are familiar challenges experienced by many African countries (Silal et al., 2012; Thiam et al., 2013; WHO, 2013). In Sierra Leone, the economic burden of malaria is compounded by the recent Ebola endemic, with little

or no information from the malaria victims regarding their coping mechanisms. The migration of postwar victims and the evolution of diseases continue to drag the already sluggish economy.

Wealth Inequality and Health Coverage

From a longitudinal study, Hosseinpoor et al., (2011) revealed that wealth-related inequality and poor service access were common in areas of high malaria morbidity and mortality rate. This information was echoed by Modie-Moroka in 2009 when he expressed that many households in rural areas of Africa did not have access to ITNs and continues to experience a high malaria incidence rate. Adding to this body of knowledge, Abiola, Gonzales, Blendon, and Benson (2011) shared that the public's view of how African governments are handling health concerns, and citizens' satisfaction with basic health services contributed to poor health outcomes (Abiola et al., 2011). It is also expressed that the availability of IPTp in remote rural areas of Africa is scarce or nonexistent when compared to the supplies in the urban cities.

The studies of the above-mentioned researchers revealed factors that contributed to poor health outcomes in many African studies. Although this information added to the body of knowledge on malaria outcomes in the region, there are gaps in the existing literature on the experiences of malaria victims, the perceptions of malaria victims, and their knowledge about the illness or treatment approach. This study is an opportunity to shed light on the knowledge base of the victims, allowing me to identify common themes that could lead toward policy changes and implementation of evidenced-based public health initiatives. Continuous research is necessary to identify initiatives that will impact

health outcomes especially for the disadvantaged and underprivileged population in Africa. Through this study, the women from the rural areas of Sierra Leone had the opportunity to share their views on malaria coverage and their access to malaria treatment.

The Role of the Male Head of Household and Malaria

In many African homes, the male is the head of household and is responsible to make major financial decisions. Results from a malaria indicator survey revealed that male-headed households experienced significant episodes of malaria morbidity than female-headed households (Boadu & Trovato, 2016). To determine the role of gender in malaria prevention, it was noted that male household heads did not allocate adequate financial resources to fight malaria (Diiro, 2016). According to male household heads, young children did not need to sleep under ITNs because their blood was not ripe enough for mosquitoes (Diiro, 2016). It was also a common belief from male household heads in rural Kenya that children experiencing high fever was related to evil spirits (Diiru, 2016). In many rural regions in SSA, the male household heads encourage families to postpone seeking malaria treatment in anticipation that the illness will improve in time (Somi et al., 2015; Stratton et al., 2013). Poverty and other structural barriers cause fathers from poor rural regions in Malawi to use bed nets for fishing (Stratton et al., 2013). This finding was corroborated by other male household heads from northern Nigeria, who emphasized the tough decisions made to use mosquito nets for fishing (Breman, Alilio, & Mills, 2014). The complexity of malaria control necessitates further studies to address and understand the role of male household heads in malaria prevention and treatment.

Climate

One common fact about malaria is the positive association between malaria and the warm tropical climate and rainfall in many SSA countries (Arab, Jackson, & Kongoli, 2014). Temperature and humidity create a viable condition for mosquitoes. The amount of rainfall impacts the mosquito population by creating stagnant pools of water which provide breeding grounds for mosquitoes, thereby increasing the mosquito population (Chua, 2012). Likewise, higher temperature stimulates the growth of the parasites in the mosquito, allowing it to complete its cycle (Jackson, Colson, Johansen, Furlong, & Sellers, 2015). In a retrospective study to examine malaria morbidity and mortality rate in ten African countries, the author reported a 32% increase in malaria incidence in warmer years (Jackson, et al., 2015). Arab et al. (2014) pointed out that the increased mosquito population during a long rainy season was directly related to the endemic transmission of malaria during the rainy season. Added to the complexity of malaria epidemiology, climate variables, precipitation, parasite life cycle, and the weather are significant determinants of malaria transmission (Arab et al., 2014; Jackson et al., 2015).

Household Factors

The quality of housing is considered a determining factor for malaria transmittal. Studies show that people living in houses with mud walls, and missing ceilings are at considerable risk for malaria (De Silva & Marshall, 2012). Semakula, Song, Ache, and Zhang (2016) shared that in Burkina Faso, the use of electricity increased the risk for malaria because of a reduction in the use of biomass fuel which produces smoke that kills mosquitoes. In some African cities, septic tanks are vector breeding sites for mosquitoes,

causing an increase in mosquito activities (Semakula et al., 2016). Waste collection, poor hygiene, and poor sanitation are significant contributing factors to the high incident of malaria in rural and urban communities (De Silva et al., 2012). Improper disposal of household waste causes a collection of liquid waste in stagnant water and creating additional breeding sites for mosquitoes (De Silva et al., 2012). Inadequate quality housing in rural and urban communities provide breeding sites for malaria parasites and increase the malaria risks for the vulnerable population (Hagenlocher & Castro, 2015).

Malaria in Children

Notwithstanding previous reports that indicated a high prevalence rate of malaria among young children in Africa, the prevalence of malaria among young children of all ages is underestimated because of poor reporting and record keeping (Van Eijk et al., 2015). Few studies comments on the malaria incidence in children between the age of five years and 14 years, as the focus has been on children below the age of five years (Ceesay et al., 2015). Reports show that approximately 50% of malaria-related deaths in SSA is for children below the age of five who have low immunity and are highly susceptible to the disease (Ceesay et al., 2015; Nankabirwa et al., 2014; Van Eijk et al., 2015). Infection in infants may be relatively limited by passively transferred maternal antibodies or possibly by lower attractiveness of infants to mosquitoes (Anchang-Kimbi et al., 2015). From a cross-sectional survey in 2015, Ceesay et al. reported a high prevalence of malaria among infants below 6 months in Guinea, The Gambia and Benin, with the disease being associated with anemia and fever. Contrary to other findings, it is also reported that infants' protection against malaria is for a brief period with an

increased risk for malaria within the first 6 months of life (Anchang-Kimbi et al., 2015; Ceesay et al., 2015). This report correlates with the high malaria prevalence rate in children derived from malaria indicators household surveys in many SSA countries (Van Eijk et al.,2015). Although the need for malaria prevention and treatment guidelines for children is recognized in malaria-endemic countries, the interpretation of previous study findings on malaria prevalence and outcomes is challenged because of variations in sample sizes, study designs, and lack of quality control (Anchang-Kimbi et al., 2015).

Furthermore, an increase in the incidence of malaria in school-age children is anticipated as children continue to acquire immunity to malaria late in life (Nankabirwa et al., 2014). The prevalence of malaria among school-age children in SSA varies depending on conditions such as seasonal conditions, socio-economic status, and transmission settings (Clarke, Roschnik, & Rouhani, 2012). In 2014, Nankabirwa et al. (2014) revealed a 0 – 71% prevalence rate among school-age children in Kenya depending on seasonal variations. About 50% of school-age children in Cameroon, The Gambia, Mauritania, and Senegal experience malaria, with approximately 30% experiencing severe malaria that often leads to increased absenteeism mainly from the primary schools (Nankabirwa et al.,2014). In 2013, Clarke et al. (2013) estimated that 50% of deaths among children between the ages of 5 – 14 years is attributed to complications from malaria. Little emphasis is placed on diagnosis, prevention and treatment of malaria among school-age children in SSA, where the use of ITNs among this population group is limited as compared to other population groups (Clarke et al., 2015; Broker et al., 2014). With an increase in the prevalence rate of malaria among

school-age children, the need to promote malaria preventive and intervention efforts among this age group is essential to impact the malaria prevalence rate in SSA (Brooker et al.,2014). Participants from this study had the opportunity to share their perceptions about malaria and its impact to different age groups including children

Knowledge, Attitudes, and Practices Related to Malaria Prevention

In many malaria endemic countries, the knowledge about malaria and practices toward malaria prevention and treatment varies. The use of ITNs and ITPs are widely promoted by international organizations and local governments. Nonetheless, the implementation of such malaria-preventive measures is jeopardized by economic factors, traditions, beliefs, and limited resources. Researchers have contended that factors contributing to a lack of ownership and use of ITNs include costs, education level, lack of knowledge about causes and transmission of malaria, and lack of knowledge about malaria prevention approaches (Antwi & Marfo, 2008; Thiam et al., 2013; WHO, 2013). Regarding practices, sleeping under bed nets was the most prevalent method of malaria prevention and control (87%) as revealed by Antwi and Marfo (2008). Despite the high prevalence of malaria in rural villages, Antwi and Marfo concluded from their qualitative study that many community members from rural areas did not use nets properly because of lack of knowledge and that some people used bed nets as curtains in their homes (Antwi & Marfo, 2008). Traditional beliefs and cultural practices that included treatments from local healers contributed to the malaria morbidity and mortality rate in many rural areas in Africa (Antwi & Marfo, 2008). The knowledge of medicinal plants for malaria is widely used in many SSA countries. In 2014, Mueller et al. (2014) reported that

approximately 75% of malaria victims from rural areas in SSA seek traditional healers for malaria because they are affordable and available unlike Western medicines. Despite the wide-spread use of traditional healers for malaria, there are insufficient clinical data on the safety and efficacy of herbal medicines (Mueller et al. (2014)). Traditional healers do not have a consensus on the types of plants and dosages appropriate for malaria treatment (Antwi & Marfo, 2008; Mueller et al., 2014). On rare occasions, traditional healers refer malaria patients to hospital if they do not respond to treatment and these patients are deemed to be possessed by evil spirits (Antwi & Marfo, 2008). Recommendations for malaria initiatives continue to include intense education on the use of ITNs.

In 2014, a cross-sectional study conducted by Mwanje (2014) in Uganda showed that the participants ranked malaria as an important health issue and described unproven prevention treatment methods. The use of untreated bed nets, unproven prevention and treatment methods, and the use of different ineffective traditional malaria remedies was conveyed (Mwanje, 2014). The local healers tried different herbs and treatments on different patients with no information provided on side effects (Mwanje, 2014). Singh et al. (2014) shared that traditional healers from norther Nigeria have different approaches to the treatment of malaria and other tropical diseases. This notion is echoed by Van Eijk et al. (2015) whose findings from a cross-sectional study in southern Africa indicted inconsistencies in the use of herbs by traditional healers, causing malaria victims to be unsure about the effectiveness of local treatments. The lack of indoor and outdoor control measures, poor treatment approaches, and self- medication were associated with higher

malaria risk in Uganda (Mwanje, 2014). Additionally, community members in many African villages are constrained from taking appropriate prevention toward malaria because of resistance from male head of households, expendable income, misconceptions about the safety of ITNs, and distances to facilities distributing ITNs (Rowe et al., 2006; Williams et al., 2009). Information from malaria victims in Sierra Leone about their knowledge and treatment for the disease is missing from current literature.

Malaria in Sierra Leone

Sierra Leone ranks as one of the poorest countries in the world, with 75% of the 6 million population living below the poverty line of US$1 per day (Amuasi et al., 2012). In 2015, over 50% of the nation's population lived in rural areas (Jain et al., 2015). Coupled with the destruction in the economic and health care infrastructure, Sierra Leone continues to experience high morbidity and mortality rate from malaria, with the disease causing an estimated 1.3 million new cases and 1,734 reported deaths in 2009 (Jain et al., 2015). Additionally, it is reported that malaria is the leading cause of death among children under the age of five, responsible for 20% of child deaths in the nation (Jain et al., 2015). Furthermore, malaria-related illnesses are responsible for 48 % of all deaths, 38% of all mortality for children below the age of five, and over 45% of all deaths in rural areas; making it a significant public health problem in the country (Jain et al., 2015; WHO, 2015; Wirth et al., 2016). In 2013, Sierra Leone experienced 1.7 million cases of malaria with 4,326 deaths, and 46% of children between the age of 5 and 9 years experiencing a high malaria prevalence rate (Jain et al., 2015).

During the Ebola outbreak of 2014, malaria victims were neglected, and the progress made on malaria prevention and treatment was interrupted (Jain et al., 2015). The use of the popular drug artesunate amodiaquine to prevent and treat malaria declined as clinic workers were afraid to treat malaria victims, fearing that these victims had Ebola (Tuck & Williams, 2016). Both malaria and Ebola have similar symptoms and malaria victims went to Ebola treatment centers thinking their symptoms were Ebola-related. In 2014, the decline in malaria treatments caused by the Ebola epidemic resulted in an approximated increase in malaria cases of 88% in Sierra Leone (Walker et al., 2015). This increase is equivalent to 3.5 million additional untreated cases, with 10,900 additional malaria-attributable deaths (Walker et al., 2015). Based on 2010 levels of malaria transmissions, the disease was estimated to cause 430,000 infections during pregnancy and 31,100 low birthweight deliveries in Sierra Leone (Jain et al., 2015; Walker et al., 2015). With the disruption of health-care services from the Ebola outbreak, malaria death was estimated to increase by 46,400 in 2015 (Carias, Greening, Campbell, Meltzer, & Hamel, 2016).

Epidemiology of Malaria in Sierra Leone

Sierra Leone is heavily burdened by malaria. As one of the leading causes of illness and death in Sierra Leone, the country's population is at risk for the disease (Jain et al., 2015). Noted as one of the poorest countries in the world with sluggish economic growth, the Ebola outbreak in May 2014 threatened malaria treatments. In 2015, responses to the 2014 Ebola outbreak in Sierra Leone overwhelmed the nation's healthcare system, reducing treatments for endemic disease such as malaria, TB, and

HIV/AIDS; leading to catastrophic outcomes (CDC, 2015). The WHO reported that an estimated 50 % reduction in access to health services resulted in exacerbated malaria mortality rates with a death toll of 2,819 and an indirect impact of a substantial increase in the mortality rate of other diseases (Walker et al., 2015). Furthermore, during the Ebola era, the burden of uncomplicated and severe malaria was underestimated because of the decrease in malaria surveillance activities (Walker et al., 2015).

Transmission of malaria occurs all year round in Sierra Leone, with the prevalence rate of infection estimated at about 65% (Jane et al., 2015). The parasite distribution is mainly *Plasmodium falciparum* (90%) with mixed infections occurring occasionally with *Plasmodium malariae* and *Plasmodium ovale* (Jain et al., 2015). In Sierra Leone, the resistance to chloroquine warranted a change in the malaria control treatment. The current recommended malaria control efforts in Sierra Leone include the use of an artemisinin-based combination therapy (ACT). In 2004, government officials in Sierra Leone identified artesunate-amodiaquine (AS+AQ) to be the first-line treatment of choice for uncomplicated malaria and artemether-lumefantrine (AL) in cases of contraindications. For severe malaria, the recommendation is quinine and artemether (AM) is the alternate. Sulphadoxine pyrimethamine (SP) is used for intermittent preventive treatment in pregnancy (IPTp). In addition, the government of Sierra Leone has introduced a new fixed dose combination (FDC) of ASAQ tablets, taken over 3 days, to treat uncomplicated malaria, with the aim of improving prescribing practices, patient compliance, and reduce the risk of parasitic resistance to AS+AQ (Jain et al., 2015).

Policy on Malaria Treatments in Sierra Leone

To address the alarming malaria problem in the country, the government continues to partner with international organizations to provide prevention and intervention measures to mitigate the impact of the disease. At the national and local levels, policies on malaria reflect the recommended first-line treatment of artesunate-amodiaquine and the long-acting dihydroartemisinin-piperaquine given monthly. Mass drug administration and distribution of insecticide-treated nets during the rainy seasons are promoted to decongest the healthcare system and reduce malaria cases. The campaign to deploy mass administration of long-lasting artemisinin combination treatment drugs aims to provide protection from malaria in areas with inadequate health care and poor access to healthcare (Walker et al., 2015). During the Ebola epidemic in Sierra Leone, the near cessation of malaria control led to a resurgence in malaria cases and deaths. New policies mandated an increase in malaria surveillance to avoid the risk of Ebola infection, protect against malaria, and mitigate the health-care burden of malaria in clinics (Amuasi et al., 2012; Walker et al., 2015). The campaign to continue mass drug administration and distribution of ITNs during malaria transmission seasons is expected to reduce malaria morbidity and mortality rates (Walker et al., 2015).

Summary

Malaria is a curable and preventable disease that continues to plague many countries in SSA. Pregnant women and children under the age of 5 experience high morbidity and mortality rate from malaria. From the literature review, it is evident that malaria poses an economic burden on individuals, communities, and nations. In postwar

Sierra Leone, more than 50% of the population live in rural areas where malaria control is minimal and substandard (Jain et al., 2015). Although the use of ITNs is widely promoted and encouraged in SSA, many individual and national factors hinder the availability and use of this measure. The above literature review revealed that ITNs have been proven to reduce the incidence of malaria, malaria-related illnesses, the mosquito population, and deaths from malaria. Current literature provides extensive information on malaria treatment measures. However, very little is noted on the perceptions of malaria victims. Additionally, the current literature provides information about malaria efforts in Sierra Leone and statistical information on the impact of malaria, with no specific information about the impact of the disease in rural Sierra Leone. With the population growth in rural areas in postwar Sierra Leone, it is necessary to explore the perceptions of the vulnerable and disadvantaged population of this region. Application of the theory of HBM guided this qualitative phenomenological study to explore and describe the perceptions of women on malaria from the western rural area of Sierra Leone. Chapter 3 outlines the research design for the study with detailed explanation of the research instrument.

Chapter 3: Methodology

Introduction

This chapter is an outline of the method that was used in the study. Through this qualitative study, I explored and described the lived experiences of women from the western rural area of Sierra Leone pertaining to malaria. The devastation of malaria has continued to plague many SSA countries, with significant impact on women and children under the age of 5. Currently, there is no shortage of information on malaria treatment measures. However, information on the perceptions of malaria victims is scarce. Components of this methodology discussion include the rationale for the identified research design, the recruitment process for study participants, sample size, instrumentation tools, and data analysis methods. I provide information on how I secured the data and how I provided internal validity for the data. I describe the ethical procedures necessary to protect the study participants while collecting primary data for the study.

Research Design and Rationale

This was a qualitative phenomenological study to describe the experience of the study participants. Creswell (2013) asserted that the goal of phenomenological research is to describe participants' experiences in a specific context to understand a specific phenomenon. The purpose of this qualitative study was to explore and understand the lived experiences of women from the western rural areas of Sierra Leone as they sought out treatments for malaria. This approach was appropriate for this study because the participants could express their views and experiences of the disease in their own words.

Using the lens of a socioeconomic approach and guided by the theory of HBM, women from the western rural area of Sierra Leone described the factors they considered when deciding on malaria treatments and their experiences with the disease. Understanding the perceptions of women and factors that influence women's decisions on malaria treatments is necessary to enhance the body of knowledge on malaria.

The application of a qualitative design to this study was appropriate because qualitative methods are beneficial in providing information on unknown phenomena. Qualitative design provides a natural approach to unknown phenomena, which is an advantage when exploring culturally diverse and complex issues (Creswell, 2013). In qualitative inquiries, researchers build patterns and themes while collaborating with participants interactively to shape themes or abstractions from the process, allowing the process to change after data collection has started (Creswell, 2013). Additionally, in qualitative research, the researcher keeps a focus on learning the meanings that participants hold about the problem (Creswell, 2013) to gain understanding of human experiences that fill the gap between "knowledge and reality" (Crosby et al., 2013, p.170). By applying a qualitative approach to this exploratory research, I uncovered information from women on malaria to address the gap in the current literature.

The Role of the Researcher

As a qualitative researcher seeking to understand the perceptions of the study participants on malaria, I was part of the research process and the primary research instrument that was used to gather the data. In qualitative studies, the researcher becomes the instrument that is used to comprehend and learn about human experiences by

interpreting and describing subjective information shared (Creswell, 2013; Davies, & Dodd, 2012). As the researcher, I was involved in the research process, which included identifying the research question, deciding on an appropriate approach to collect data to answer the research question, creating the research instrument, identifying study participants, applying specific criteria in selecting participants, and analyzing data to answer the research question. For this phenomenological study, data collection occurred through personal interviews, with simultaneous analysis of the data until theoretical saturation was achieved.

I am originally from the village of the participants and have a general knowledge of the makeup of the village and its residents, culture, traditions, and religious practices. I also have relationships with the local school and church officials and did not anticipate difficulties in soliciting study participants. Additionally, I had the cooperation and trust of the study participants because I was working with people with whom I had established rapport. It is inevitable for qualitative researchers to form close relationships with study participants to make them feel at ease and willing to provide information (Fink, 2014). Through open-ended questions, I encouraged the participants to provide elaborate answers that were recorded, coded, categorized, and further analyzed. A qualitative researcher is encouraged to test for reliability and validity at all stages of the research process before reporting findings (Patton, 2015). I recorded all interview sessions, asked for clarification, and took notes to avoid transposing or misinterpreting the information. I am obliged to protect the information collected and safeguard the anonymity of the participants by refraining from using individual names. It is expected that qualitative

researchers have a strong loyalty toward study participants by protecting data and maintaining anonymity (Collins & Cooper, 2014; Fink, 2014).

Population

The study participants were women from a village in the western rural area of Sierra Leone. Women are part of a disadvantaged population at risk for malaria, and the rural regions of SSA have been identified as deprived of health services, with high morbidity and mortality rates from malaria (Silal et al., 2013; Williams et al., 2010). Reports from the CDC showed that "rural indigenous populations in SSA die in greater numbers due to malaria infections than in any other parts of the world" (Arori, 2011, p.39). Like many rural African regions, rural areas of Sierra Leone are heavily burdened by malaria, with disadvantaged victims being women and young children. Women in these areas have limited access to health, are socioeconomically disadvantaged, have low literacy levels and live in overcrowded and unsanitary conditions (Jain et al., 2015). Furthermore, the perceptions of women from rural SSA are underexposed or omitted in current literature. Understanding the perceptions of women from rural areas of Sierra Leone is necessary to support the quest to promote social change and improve health outcomes.

Sampling and Sample Size

A purposive sampling technique was identified for this study. As described by Crosby et al. (2013), the goal of purposive sampling is to focus on specific characteristics of a population of interest, which will best enable the researcher to answer the research questions. In this study, the participants met the characteristics identified in the

recruitment criteria. Creswell (2013) asserted that in a qualitative phenomenological study, each participant should significantly contribute to the study by advancing the investigation. In qualitative research, "what is prominent is not the number of participants, but the significance of the investigation and whether the research outcome is trustworthy" (Chenail, 2015). It should be noted that the sample size for a purposive sampling strategy is determined by theoretical saturation (DePaulo, 2013). Theoretical saturation involves a data collection process that includes concurrent data analysis until no new insight on the research problem is introduced (Mack, Woodsong, Macqueen, Guest, & Namey, 2015). For this study, saturation was determined when the information from the participants no longer contributed to the research questions.

Fifteen participants were recruited. Two of the participants were part of a pilot study to test the validity of the questions. The other 13 participants participated in the actual study. In qualitative studies, a small sample size is appropriate because the focus is understanding phenomena from the viewpoint of the participants, with no emphasis on generalization (Crosby et al., 2013). The focus is the interpretation of the individual participants' responses while also revealing common themes across participants' responses (DePaulo, 2013). The participants were from a village located in the western rural area of Sierra Leone. The current population of the village is predominantly made up of people from the Krio tribe, with the common languages of Krio and English. To recruit the study participants, I posted flyers in churches and schools.

Recruitment

Before posting flyers in church offices and schools, I gained permission from appropriate officials from those facilities. The flyer was posted for a week because of a high response rate. The information on the flyer included the purpose of the study, participant eligibility criteria, the financial incentive, and the duration of the study. For the identified participants, the financial incentive was appealing because of their low socioeconomic conditions. According to the WHO (2015), rural populations in many African countries live under poor conditions and have little or no access to health clinics. Interested volunteers completed the recruitment form attached to the flyer, placed it in the envelope provided, and dropped it in a locked box at the churches and schools. At the end of a week, I collected the flyers from the churches and schools, responded to the volunteers who filled out the form with a telephone call, introduced myself, and explained the process of data collection. I used the information received over the telephone to eliminate those participants who did not meet the required criteria. After eliminating ineligible participants, I set a date, time, and location for a face-to-face meeting with each participant. At this meeting, I reviewed the nature of the study, ensured that all the participants understood the purpose of the study, informed participants of their right to withdraw from the study at any given time, and answered all questions. All participants signed a consent form and received a copy of the signed consent. I assured the study participants of their anonymity and informed them of how the results of the study would be disseminated.

Inclusion and Exclusion Criteria

For this study, I solicited women's perceptions about malaria. Participants met the following criteria:

- lived in the western rural area of Sierra Leone (visitors to this region were excluded),
- from the Krio tribe,
- above 21 years of age,
- had known or taken care of someone with malaria, and
- spoke fluent English.

. Women who had personally suffered from malaria were not recruited because in many African settings and cultures, discussion of personal illness with nontraditional healers is taboo because of traditional reasons, norms, and religious beliefs (Adeneye, Jegede, Mafe, & Nwokocha, 2013).

Selection Bias

In a qualitative study, selection bias occurs when the selection process in the design of the study suffers from systematic errors (Crosby et al., 2013). In that I used a qualitative approach with purposive sampling, my participation in the research and interpretation of the information posed risks of interviewer bias. In this study, the application of purposive sampling made it possible to recruit subjects who had experience with malaria so that I could categorize the subjects according to criteria based on the research questions. I refrained from attaching to any specific viewpoint. As indicated by

Crosby et al. (2013), to mitigate the risk of interviewer bias, the researcher must refrain from being attached to a certain viewpoint, as this would jeopardize impartiality.

Data Collection Method

Data collection took place through a face-to-face interview that was semi structured. In qualitative studies, the researcher is part of the instrument. In this study, I developed a questionnaire to conduct face-to-face interviews with the participants. Through this approach, participants provided information based on their lived experiences with malaria and their perceptions about the disease. The questionnaire (Appendix A) consisted of 32 open-ended questions guided by the theory of HMB and categorized into themes. The interview questions covered religious beliefs and malaria, knowledge of malaria, malaria practices, malaria treatments, and sociocultural aspects of malaria. Guided by the HBM, the questions related to perceived susceptibility, severity, beliefs, and barriers that influenced participants' behavior toward malaria to generate information that answered the research questions. The HBM shows a correlation between people's readiness to act, their beliefs about their risk factors for diseases or health problems, and their perceptions of the benefits of acting to avoid such diseases (Glanz et al., 2008). Before implementing the questionnaire, I conducted a pilot study with two of the recruited participants to assess the validity and reliability of the tool to provide information to answer the research questions. Through the pilot study, I determined the dependability of the research instrument to ensure saturation. These two participants provided responses that were appropriate to answer the research questions and were included in the final study.

Data Collection Procedure

I met the recruited participants at a predetermined place and time to conduct the interviews. The interviews took place in a private room at a public library. In the interest of equality and respect, I paid attention to where the interview was held, seating arrangements, and how the interviewees were welcomed. I established phone rapport with the participants before conducting the interviews. Establishing rapport and a relaxed atmosphere is often necessary to get people to talk and express themselves without reservations (Turner, 2010).

I developed a written interview guide to serve as a protocol for the interview session and promote reliability of the data collection process. This interview protocol is outlined in Appendix B. As Turner (2010) explained, "An interview guide developed through reflection of the research questions for the collection of phenomenological data through interview allows interview subjects to describe their experience about a given phenomenon" (p. 128). Therefore, the specific interview questions were designed to identify information that would provide an understanding of the participants' experiences, beliefs, and perceptions of malaria. Each participant was interviewed individually, with each session lasting for approximately 30 to 45 minutes. A semi structured interview is essential to allow participants to share their lived experiences about diseases in naturalistic settings, describing in their own words what they feel is important (Crosby et al., 2013). Through probing and expanding on the participants' responses, I derived information to answer the research questions. The first four questions provided demographic information. Questions 5 through 10 related to the participants'

knowledge about the disease, and Questions 11 through 32 related to the participants' perceptions of tradition, sociocultural aspects, and beliefs about malaria.

The goal was to collect data in such a way that I imposed a minimal amount of bias on the information (Reeves & Hodges, 2008). At the onset of each interview session, I introduced myself, explained the purpose of the interview, described the duration of the interview, and informed the participants of the voluntary nature of their involvement and their ability to withdraw without penalty at any time if needed. Additionally, I notified the participants that I would record the interview, shared information on how the results of the study would be disseminated and assured the anonymity of their identification. Taping of interviews is an advantage because the researcher can proceed without note taking, but with information available later for transcription and full analysis (Chenail, 2015; Turner, 2010). At the end of each interview session, I thanked the participants, provided a contact number, and notified them of when and where they would receive the interview transcripts.

Data Coding and Analysis Procedures

To make sense of the data, I started primary analysis of the data immediately as the information was provided. At the end of the collection process, I coded the data to facilitate further analysis. By reflecting on the purpose of the research, I identified and categorized information to be labeled by themes. The constructs of the HBM informed the themes. Categorizing data into themes allowed me to organize the data into manageable classifications to facilitate analysis of the information.

I used the NVivo software to organize the data and manually code them into themes. In qualitative data, coding of data requires concurrent interpretation of the meanings of the data (Crosby et al., 2013; Turner, 2010). Interpretability is a significant feature of qualitative data and, although some of the data may be quantifiable, the bulk of the analysis is usually interpretative (Mack et al., 2015). Furthermore, Creswell (2013) explained that "in phenomenological studies, the focus of the researcher is to derive meanings through individual expressions" (p. 145). During the data analysis process, I asked probing questions to ensure clarity, depth, and validity (Turner, 2010) by asking for explanations, paraphrasing, summarizing the information provided, or asked for corroboration. Concepts and themes related to the current phenomenon were recorded. Throughout the coding process, I analyzed the data to ensure consistency of coded themes. I applied constructs of the HBM to code and analyze the data. Direct statements from the study participants are included in the reported data to address credibility and accuracy of the information. I identified themes by color-coding them into categories such as beliefs, experiences, practices, treatments, barriers, knowledge, religion, and socio-economic status. These themes align with the constructs of the HBM. To aim for comprehensiveness and achieve saturation, I looked for patterns in the analyzed data to answer the research questions and derived conclusions.

Limitations

The main limitation is that the study focused on the perceptions and lived experiences of malaria among women in one rural village of Sierra Leone. The information is unique to the specified study participants, so it cannot be generalized to

other regions within the country. However, the data provided knowledge on previously unknown perceptions of the disease that could be incorporated in malaria prevention and treatment measures.

Another limitation is that participants were restricted to English speaking individuals, creating another limitation for the study. Furthermore, the specificity of the sampling approach limited the participants to unique criteria to ensure that the information provided answer the research questions. Although the research design geared toward answering the research questions, it should be noted that experiences of malaria victims are diverse, and variations of the general population was not included in the study. As suggested by DePaulo (2013) "the problem associated with sampling is ever present and needs to be addressed to ensure the credibility of research findings and undertakings" (p.119). In qualitative studies, the object of the research places limitations on the researcher (Turner, 2010). Another limitation of the study was from the tribal affiliation of the study participants who came from the Krio tribe. In many SSA countries, health beliefs and perceptions are highly influenced by tribal norms and rituals (Silal et al., 2013). Therefore, the information is associated to Krio women and the validity of the study is restricted to the uniqueness of the study participants.

Validity

In qualitative studies, validity is influenced by the researcher's perception of the term. Creswell and Miller (2000) suggested that "validity is conceptualized as trustworthiness or rigor, and it determines whether the research measures what it intended to measure" (p. 126). Through this association, the researcher's focus is "to eliminate bias

and increase the researcher's truthfulness about a phenomenon" (Davies & Dodd, 2012, p. 282). To ensure trustworthiness, I conducted a small pilot study of the interview questions to ensure that the information generated from the questions answered the research question. I engaged fully with the interview sessions, took notes, recorded the sessions, probed, and asked for clarifications to ensure that the research instrument provided information that was trustworthy and objective to the study. To minimize interview bias and distortions from my presence, I maintained a personal journal of thoughts and insights about the study and remained engaged with the participants to achieve data saturation. Finally, I continued to interview new participants until saturation was achieved before terminating the interviews.

Ethical Procedure

To conduct a qualitative phenomenological study that explores and describes the perceptions and lived experiences of women on malaria, I applied ethical principles of honesty, objectivity, carefulness, respect for intellectual property, confidentiality, protection of human subjects, and social responsibility. To avoid misrepresentation of the data and remain objective, I coded the information into themes and quote some of the participants' responses. I cited referenced texts and concepts, acknowledging and giving credits to research contributors. Before conducting the study, I submitted all required documents to secure approval from the Walden University Institutional Review Board. I embarked on the study after receiving approval from the Walden University Institutional Review Board. The Walden University's approval number for this study is 12 22 17 0375649.

In research studies that include humans, ethical procedures are necessary to maintain the rights, dignity, and respect of the study participants. The purpose is to maintain trust from the participants and protect them from any harm. The study participants received detail information about the nature and purpose of the study, their expectations, and were notified of their protection. Participation in the study was voluntary, with the participants having the freewill to leave the study without penalty. To maintain the anonymity of the participants, each was identified by a pseudo name. Participants would receive a disclosure of the study results and how it would be disseminated. Each participant signed an informed consent and received a copy of the signed consent before taking part in the study. Participants received a token at the end in appreciation for their participation.

Informed Consent

The informed consent is a "voluntary agreement to participate in a research and a process to provide information about the research and its risk" (Creswell, 2009, p. 89). The informed consent was in English and provided information on the nature of the study, the purpose, incentives, protection to human rights, risks, procedures to follow, and the use of the study results. I ensured that participants understood the nature of the study and provided answers to all questions before signing the consent. The consent covered participants' right to discontinue the study without penalty. I obtained the inform consent through a nonthreatening and culturally appropriate manner. This process took place in a formal predetermined location, agreed upon by the participants. Participants read and understood English and understood the content of the informed consent before

signing. I provided each participant a copy of the signed consent and archived the originals in a locked file with the key in my possession.

Summary

In this chapter, I described the design and methodology of the study to include the data collection process, the population, data analysis, and ethical procedures. A semi structured, open-ended interview was appropriate for this phenomenological study to explore and describe the perceptions and lived experiences on malaria from women from the western rural area of Sierra Leone. The study design was appropriate because of its flexibility to allow study participants to describe lived experiences in naturalistic settings. The interview questions and data analysis were guided by the HBM to describe the perceptions and beliefs from women on malaria. To ensure credibility and trustworthiness, I conducted a pilot study, making sure that the questions were appropriate to generate information to answer the research questions. Data collection and analysis were simultaneous until data saturation was achieved, and the information coded to derive themes. I took appropriate steps to adhere to the rigidity of ethical procedures in research and maintain the human rights. Obtaining informed consent is an integral part of the research process that was accomplished. Data collection commenced after obtaining approval of the Walden University Institutional Review Board. Chapter 4 is an outline of the result of the study and a disclosure of the steps taken to ensure trustworthiness of the study.

Chapter 4: Findings

Introduction

The purpose of this phenomenological study was to explore and describe the lived experiences of women with malaria and the factors that influence their decisions on malaria prevention and treatment. In this chapter, I discuss the findings of the analyzed data collected from the study participants. Through open-ended questions, I collected data on numerous factors that may influence women's perceptions of malaria prevention and treatment. Participants were selected from individuals who responded to fliers posted at churches and schools. Twenty-nine people responded to the flier within 2 weeks. However, only 18 people satisfied all the eligibility criteria. All 18 participants were selected for the study. However, 15 instead of 18 participants completed the interview. Participation was voluntary, and the participants agreed upon the place, time, and date for the interview. Each participant signed an informed consent after receiving an explanation of the purpose and nature of the study. All interviews took place at the public library after notifying library officials of the date and time of the interviews. To ensure privacy, participants remained anonymous and were identified by pseudonyms. An assigned room at the library also guaranteed privacy. All participants had experienced taking care of someone with malaria or knew someone with the disease.

Below, I provide an overview of the pilot study, research settings, participants' demographics, method of data collection, and analysis. The emerging themes from the study are outlined, followed by evidence of trustworthiness and a summary.

Pilot Study

The first two volunteers who fulfilled the requirement for participation were part of the pilot study. The participants signed a written consent after receiving full disclosure of the nature and purpose of the study. Both participants remained anonymous and understood the voluntary nature of their involvement in the exercise. The purpose of the pilot study was to ensure consistency in the interview protocol and the effectiveness of the interview questions to generate responses that answered the research questions. In qualitative phenomenological studies, pilot studies test the clarity of the interview questions and provide validity of the research instrument (Yujin, 2016). Additionally, pilot studies provide an opportunity for specific practical and methodological issues to emerge, allowing researchers to assess and make changes to the research instrument (Lancaster, Dodd, & Williamson, 2014). Furthermore, Lancaster et al. (2014) attested that "a well-conducted pilot study within a formal framework will encourage methodological rigor" (p. 309). The pilot exercise revealed the effectiveness of the interview questions, ensuring the reliability and validity of the research instrument. Responses from the participants were pertinent to the research questions. No changes were recommended. Therefore, information from the two participants in the pilot exercise was included in the study results.

Research Setting

The study took place in Wilberforce, one of the mountain villages located in the western area of Sierra Leone. Respondents to the flier were initially contacted by phone, during which time their eligibility was validated, and a date, time, and place were set for

the face-to-face interview. An interview protocol was established and was used to ensure consistency in the interview process. The interview protocol was discussed with all participants before commencing the interview. All participants signed an informed consent and received a copy of the signed consent. All interview documents were secured in a locked location only accessible by me.

Demographics of Participants

The study participants included 15 women who lived in a rural village and had taken care of someone with malaria or knew someone who had suffered from the disease. Through purposive sampling, eligible participants fulfilled the specific criteria necessary to be included in the study. The eligibility criteria were outlined in the recruiting flier, verified during initial contact with each participant and before signing of the informed consent. As shown in Table 1, the age of the participants ranged from 21 to 55 years. There were no participants above the age of 55 years. Six or 40% of the participants were between the ages of 21 and 35 years, five or 33% of participants were between the ages of 35 and 45 years, and four or 27% of the participants were between the ages of 45 and 55 years. Seven or 47% percent of all participants had primary school education, six or 40% of the participants had secondary school education, and two or 13% of the participants had college-level education. Ten or 67% of the participants were married, three or 20% of the participants were single, and two or 13% of the participants were widowed. Six or 40% of the participants were local traders, two or 13% of the participants were primary school teachers, four or 27% of the participants were

housewives, and three or 20% of the participants were house maids. Table 1 depicts the demographics of the participants. The participants are identified by pseudo-nyms.

Table 1

Demographics of the Participants

Identification	Age group	Education	Marital status	Profession
Jane	1	Secondary	Married	Local trader
Phyllis	1	Primary	Married	Local trader
Susan	3	College	Married	School teacher
Becky	3	Primary	Married	Local trader
Theodora	3	Primary	Married	Housewife
Sarian	2	College	Married	School teacher
Josephine	2	Secondary	Married	Housewife
Joko	2	Secondary	Single	Local trader
Omo	1	Secondary	Widowed	House maid
Ola	1	Primary	Married	House maid
Theresa	1	Primary	Single	Local trader
Ayo	2	College	Married	Housewife
Beatrice	2	Primary	Widowed	House maid
Marian	3	Secondary	Married	Housewife
Lara	1	Primary	Single	Local trader

Note. Age groups: 1 = 21–35 years, 2 = 35–45 years, 3 = 45–55 years.

Data Collection

There were no deviations to the data collection process outlined in Chapter 3. Prior to collecting the data, participants who responded to the flier were selected through a phone interview after ensuring eligibility. The data collection was conducted as outlined in the IRB application. The pilot study validated the research instrument, and all participants were interviewed at an agreed date and time. To ensure privacy, all face-to-face interviews took place in a private room at the public library as agreed upon by the

participants. All participants were briefed about the purpose of the study and their level of involvement, reassured of their anonymity, and offered the opportunity to have all their questions answered. Participants were informed that the interview would be audio-taped, that field notes would be taken, and that incentives would be offered. They were assured of their free will to discontinue the interview without penalty before signing the informed consent. I adhered to the interview protocol established in advance to maintain structure and consistency. The questionnaire consisted of 32 questions. Each interview session lasted for approximately 30–45 minutes. The interview process was seamless, requiring probing to allow participants to elaborate on their responses. To ensure confidentiality and privacy of the participants and for safe keeping, all tapes and hard copies of the field notes were stored in a locked place only accessed by me. Data collected from the pilot study were also stored in a locked place. Data collection from all 15 participants, including the two participants who constituted the pilot study, lasted over 2 weeks.

Data Analysis

During the interviewing process, I applied the interpretative phenomenological analysis (IPA) approach to gain understanding of the experiences of the participants. This qualitative approach aims at providing detailed examinations of personal lived experiences and is useful for examining complex topics (VanScoy & Evenstad, 2015). The recordings from the interview were transcribed through oTranscribe, a free online web application. All transcribed data were stored in a password-protected computerized file. I reviewed the transcribed interviews and field notes several times to organize the

data according to research questions and hand code the information. I entered the data into NVivo 10 data-coding software to further manage the data and classify them into themes determined by word frequency. Data were then organized by research question to identify and classify themes specific to each research question. Themes were selected based on the similarity of meaning of words and phrases. Seven identified themes emerged, providing in-depth information to answer the research questions. The themes are listed in Table 2.

Table 2

Core Themes

Core themes	*N*	Frequency of responses
Malaria treatment, cost, and traditional herbs	15	153
Government clinics	15	52
Unavailability of medications and doctors	15	122
Causes of malaria and environmental conditions	15	113
Malaria symptoms and severity	15	103
Malaria in children and pregnancy	15	60
Use of ITNs	15	52

Emerged Themes

The research questions and related themes were as follows:

Research Question 1

RQ1: What is the experience of women with malaria?

Theme 1: Malaria treatment, cost, and traditional herbs. This theme mirrored the experiences of many participants as they described their experience of malaria. The participants were passionate about describing the factors that influenced their decisions

on malaria treatment measures. They told their stories, reflecting on their beliefs and cultural norms.

Q7: Please tell me about your experience taking care of a malaria patient. Jane responded that "People have been taking *ageeree* since childhood days, and they work …. plus, people cannot afford the prescribed medications." Theodora stated, "It is cheaper to use traditional herbs and people don't have to go to the clinics." According to Omo,

> Some people don't bother with the hospitals because there are no doctors in the clinics and they cannot afford private doctors, so they take traditional herbs like *ageeree* or *broomstone*. People have been taking these herbs for years and they work. Plus, they don't suffer from side effects from those herbs … People always have those herbs at home or can get them from neighbors.

Responses to this question by all participants revealed that many malaria victims prefer common traditional herbs such as *ageeree* and *broomstone* because of their affordability and availability. The participants stated that people believed in traditional herbs and had been taking them for decades. They added that the side effects from the malaria medications from the pharmacy were deterrents.

Q16: Where do people get treatment for malaria? Ayo stated, "Thank God for traditional herbs like *ageeree* and agbo … they really help. Some of the medicines from the pharmacy cost more than Le50,000 (50,000 Leones) and people don't even have that kind of money for food sometimes." Becky stated that "people have agbo at home for malaria and now people boil the peels from oranges and add fresh lemon to it and drink it

…. they say it helps." Participants described traditional herbs as the first line of treatment for malaria or any illness.

Q18: What are your beliefs about malaria treatments from traditional healers? Participants mentioned that traditional healers were readily available to provide malaria treatment at affordable or no cost. Joko, Ayo, and Phyllis added that traditionally, people never went to the hospital for malaria because the home remedies were effective. According to Becky, "Traditional healers are in every village and they know how to take care of malaria and they take care of people." Common traditional medicines identified included tea or broths made of tobacco leaves, mango leaves, banana leaves, lemongrass, pineapple leaves, *ageeree*, and *broomstone.* As caregivers of the family, these women believed in having local herbs on hand to address any onset of fever or malaise.

Q22: Do you have cultural beliefs that influence malaria treatment? The unanimous response to this question revealed easy access to traditional herbs. Cecilia stated, "many Creoles from the villages are used to taking agbo to prevent and treat malaria … people from villages just don't go to the hospital for malaria like that." Participants expressed a deep sense of reliance on traditional herbs, stemming from years of use. Joko explained that "you cannot give quinine to little children, but at least they can take agbo for fever." Participants emphasized that it was culturally acceptable to drink herbal mixtures as preventive measures for any kind of illness.

Q24: How costly is it to treat malaria, and do people have access to malaria treatment? The women explained that traditional herbs were less costly than Western medicines. They stated that they could get traditional herbs at no cost from neighbors and

families. Susan and Ayo stated that people were frustrated with the cost of medical treatments from doctors and the cost of prescribed malaria medications. Theodora stated, "these days, people cannot afford going to the doctors … they are too expensive … in the village, people always have agbo at home." Marian added that "During the Ebola time, people could not go to the hospital at all. They had to drink herbs at home for malaria or any illness."

Q29: How effective are traditional healers in treating malaria? Many participants felt that the traditional healers were effective in treating malaria. Josephine said, "People would go to traditional healers because they don't have to go far, and they believe they can treat them." Participants described combining traditional treatments such as fumigation, drinking herbs, and taking baths with herbal mixtures as effective. Ola said, "If you drink the herbs, and sweat with them, the fever is gone by the next day."

Theme 2: Government clinics.

Q16: Where do people get treatment for malaria? Participants knew that the government was providing free malaria treatment for children below the age of 5 years. However, everyone expressed inconsistencies with the malaria treatments from government clinics. Marian highlighted that "The government clinics are closed most of the time and when they are opened, they don't have testing materials or medicines." Jane stated, "Relatives of the clinic staff were the only ones to benefit from the services … they will tell other people that they don't have supplies." According to Cecilia, "Parents would send their children to school with malaria, and the teachers would send the

children to the clinics for treatment … most of the clinics are not far from the local schools."

Q19: What do you think about malaria treatments from hospitals? Are there any challenges? All the participants were aware of the existence of government clinics in every community but expressed their dissatisfaction with the clinics because of lack of healthcare workers or medications. Participants felt that government officials needed to pay attention to the activities at the clinics and provide supplies for the clinics. According to Beatrice,

> Every community has a health clinic. Sometimes when you go to the clinic, they do not test you for malaria because they are out of supplies … they are supposed to do a blood test, but they just look at your eyes, and if you say you have diarrhea and fever, they give you a prescription … most people cannot afford those drugs.

Joko explained that "Most times, the nurses at the government clinics would take the medications home and treat people at home for a fee." Sarian added, "The staff at the clinics don't treat you with respect and they don't have supplies or doctors …. I am not sure the government knows what goes on in the clinics." Participants felt that the government clinics were not accessible because they were not open year-round. As expressed by Theodora, "People don't have access to malaria treatment most of the time because the government clinics are closed most of the time because they don't have staff." A common theme expressed by Josephine, Lara, and Ola was that people went to traditional healers because they were accessible. Susan stated, "Some of the clinics are far away and most of the time old people cannot get to them." Phyllis emphasized the

point that "There is no need to go to the clinics because if you do not have money, the nurses don't treat you with respect."

Q28: Why do you think people would choose traditional healers or Western medicines for malaria? Many participants mentioned that traditional healers were available and that they could not rely on government clinics. Ayo and Lara echoed the notion that traditional healers remained the prime option for malaria victims because government clinics continued to fail the communities. Participants unanimously expressed their dissatisfaction with local government clinics. Like Theresa and Becky, Beatrice stated "The government continues to provide false hope to the people…the clinics are of no help…they will tell you to go to your private doctors and they are expensive…so people will just continue drinking *ageeree* or *broomstone*."

Theme 3: Unavailability of medications and doctors. This was one of the dominant themes that emerged as participants described their experiences with treating malaria. In their descriptions, participants expressed their frustrations with not having doctors and medical staff to adequately diagnose and treat malaria. They stated that the government had ignored their needs by not providing doctors and medications in the clinics.

Q12 and Q23: Why do you think people suffer from malaria, and do people have access to malaria treatment? Participants emphasized on the lack of medications, doctors, and poor environmental conditions as contributing factors to the high prevalent rate of malaria in the region. Josephine stated, "Some people don't go to hospitals for malaria treatment because they don't get free medicines and doctors are not there."

According to Ayo, “People should not bother to go to the hospital for treatment because they don’t have supplies, medicines or doctors…people will have to wait for a long time without any help.” Ola summarized her response in these words “no medication from the hospital and no doctors”. Becky’s story was that

> One time, my neighbor was having high fever from malaria and had run out of agbo. When they went to the clinic, they told them that the doctor was schedule to come once a week. They told them to go to the pharmacy and see if they could get some drugs…. Well other neighbors got some *ageeree,* lemon grass tea, and mango back leaves for her… that’s what helped her…If you depend on the clinic, you will die.”

Q28: Why do you think people would choose traditional healers or Western medicines for malaria? The unanimous response was related to availability, affordability, and accessibility to traditional healers. Some people summarized their responses by expressing the need for more doctors. Jane stated, “Too many people are suffering from malaria…during Ebola, people could not get malaria medicines…we need more doctors and free medicines.” Marian added that “Those quinine and things are too expensive anyway, agbo is cheaper.” Susan’s response was that “You don’t have to make appointments to see local healers, and they can treat you. If you don’t have appointment with those other doctors, they won’t see you., and they are expensive.” In describing their experiences with malaria treatments, participants expressed their frustrations with the substandard services from local health clinics.

Theme 4: Causes of malaria and environmental conditions. This theme was prevalent as participants described the relationship between unhealthy environmental conditions and malaria prevalence in the region. In describing mosquito bites as the prime cause of malaria, the women recognized their responsibility in keeping a clean environment to reduce mosquito breeding. They expressed the need for a cleaner environment and immediate intervention from government officials. Participants would like to see additional environmental surveillance during the rainy season.

Q8: What do you believe causes malaria? In her response, Theresa stated that, "People get malaria from mosquitoes…during the rainy season, there is mosquito everywhere especially with all the dirty gutters around, and mosquitoes breed a lot in dirty environment." Joko added "You don't want to see the gutters during the rainy season, they are full of dirt and there is water everywhere….so you see, there is mosquito everywhere… the more mosquito, the more malaria." Ayo stated, "Of course from mosquito. People don't even care to clean their compounds during the rainy season, they say the rain water will wash the dirt away. Water gather in all kinds of containers, and mosquito breeds everywhere." According to Sarian, "The government has ignored the streets and gutters…people will continue to suffer from malaria if the government don't clean the gutters." Many participants mentioned that to mosquitoes breeding in dirty environment as a significant contributing factor to the high prevalent rate of malaria in the region.

Q11: What do you think can be done to prevent malaria? In addition to other suggestions, Susan stated, "Keeping the environment clean. In the slump areas, there are

no litter bins and there is garbage everywhere…during the rainy seasons people just throw trash in the gutters… the government is not doing anything." Omo summarized her response by saying "Mam, our people are suffering from malaria, the government don't care…they don't clean the gutters, too much mosquitoes everywhere… the more mosquitoes, the more malaria". Lara stated, "If people can keep their surroundings clean and get rid of water containers in their compounds, mosquitoes won't have much breeding sites, and maybe with less mosquitoes, many people won't suffer from malaria". The use of ITN was mentioned as a recommended preventive measure for malaria. However, participants expressed that the cost, hot temperature, and the discomfort from sleeping under nets, were deterring factors. The general response to the use of ITNs was that "People cannot afford those things, and they are uncomfortable."

Theme 5: Malaria symptoms and severity.

Q9: What are some of the signs and symptoms of malaria? Participants recognized malaria symptoms to include fever, vomiting, weakness, diarrhea, poor appetite, yellow urine, and body ache. It was the general belief of the participants that if someone had fever, it was malaria-related. Generalized body ache or malaise was also considered malaria-related. Becky summarized her response in these words "Whenever people have malaria, the first thing is that they have fever, body ache and they cannot eat…if they don't take treatment, they will die." Omo added "With malaria, people have high fever, and they lose appetite…making them weak and anemic." Additionally, participants noted that fever was the prime symptom of malaria. According to Joko "The way you know someone has malaria is because they have fever." In her story, Ayo stated

that, “Sometimes people will have fever first, and in some cases, people will start shivering, and complain of body ache or weakness… then you know they have malaria.”

Q13: Do you think that malaria is a severe problem? If so, why? Many participants believed that malaria could cause health complications and it could be deadly. Susan said, “People think malaria is normal and, so they are not too concerned…but you can get jaundice and be anemic from malaria… malaria can destroy your health.” According to Marian, “When people don’t get treatment for malaria on time, it can lead to jaundice, severe anemia, cerebral malaria and death.” Omo added, “Malaria can kill you. With high fever, vomiting and diarrhea many people die. If you go to the hospital, they will give you iron tablet because they know that you can be anemic from malaria.” Cecilia said, “During Ebola time, many people suffered from severe malaria and complications from malaria…. dehydrations, anemia, jaundice, and people died.” In describing the symptoms of malaria, participants perceived that fever was an indication of malaria.

Research Question2

RQ2: What do the women of the rural area of Sierra Leone know about causes and treatments for malaria?

Theme 1: Causes of malaria and environmental conditions.

Q8: What do you believe causes malaria? As participants described the causes of malaria, environmental conditions were identified as contributing factors to the high prevalence of mosquito. They believed that puddles of water during the rainy seasons, provided breeding grounds for mosquitos during the rainy seasons. In her response, Lara

stated "you get malaria from mosquito bites." According to Ola, "People are living around dirty gutters with mosquitoes everywhere, so you see, that's why people are suffering from malaria…it's even worse during the rainy seasons when the gutters are filled with garbage." To summarize her response, Beatrice said that

> We keep fighting malaria, but we are not getting anywhere…People live in slumps, and there is no drainage system because the gutters are filled with dirt and containers with water where mosquitos breed. It is sad, but people don't know what to do because they don't have anywhere to throw away garbage. The more people living in the slums, the more garbage for mosquitos to breed."

Theme 2: Malaria treatment, cost, and traditional herbs.

Q16: Where do people get treatment for malaria? Participants identified traditional herbs as the preferred approach because of its availability. Cecilia stated, "There is medications at the pharmacy, but they are expensive for most people, so people just get agbo and other traditional medicines." Joko added, "We boil the back of oranges and other leaves to make agbo, and drink *ageeree.*" According to Ayo, "Some of the medications that the doctor prescribes make you feel bad when you take them, people are used to agbo…and it works." Some participants indicated that combining Western medicines with traditional herbs was not uncommon for severe malaria. In her response Lara stated that, "People will start taking agbo at home and if the fever does not go away, they may go to the hospital….but, they will continue drinking agbo even if they give them quinine or other medicines."

Q17: From your opinion, what are some of the malaria treatments that you believe are beneficial? The participants expressed their dependency on traditional herbs, such as *ageeree* and *broomstone*, emphasizing the importance of availability, reliability, and their effectiveness to treat the disease. Cecilia stated, "People know that agbo works… you take it in the morning and afternoon and the fever will last for maybe two days then you feel better." In describing her beliefs about malaria treatments from traditional healers, Josephine explained that "People believe in traditional medicines… they are used to taking them…plus when you go to the clinics they don't even have medicines or supplies." Susan mentioned that "agbo is good for everyone including children and pregnant women … they work."

Q19 and 24: What do you or people you know think about malaria treatments from hospital, and how costly is it to treat malaria? Participants identified common Western medicines for malaria to include quinine, chloroquine, and iron tablets. They indicated that combining medications was a common approach to address severe malaria. The participants stated that they could not rely on malaria treatments from hospitals because of poor access to hospitals and lack of medications from the hospitals. The general response was that malaria medications prescribed by doctors are expensive and mostly unaffordable. Becky mentioned that "Sometimes the medications are so expensive, so people will ask the pharmacy for another type of medication or go home and take agbo." As stated by Ayo "agbo is cheap, and you can get them free sometime, that's what people generally take for malaria." Omo added that "People just don't take quinine or chloroquine alone, they have to take agbo for the fever." Participants

emphasized that if Western medicines were taken for malaria, they were combined with local herbs.

Theme 3: Unavailability of medications and doctors.

Q23: Do you or people you know have easy access to malaria treatments? Participants stated that people continued to take traditional treatment for malaria because of the lack of medicines, medical supplies, and doctors at government clinics. According to Cecilia, "There are government clinics around but going to those clinics is a waste of time, they don't have medicines or doctors, people just have to take traditional medicine." Joko summarized her response in these words "People are suffering…People don't have medicines…. People have to drink *ageeree*, *broomstone*, lemon grass tea, and other types of herbs." Jane said "We hope that one day, the government will provide us malaria medicines as they claim to do. But as for now we don't get any medicines from the government."

Theme 4: Malaria in children and pregnancy.

Q27: Is malaria common among children? If so, how are the children treated for malaria, and does it affect their schooling? Participants were aware of the free malaria treatment offered by the government for children below the age of 5 years. Susan expressed her views in these words "Children come to school with fever, body aches, and other symptoms of malaria, so we send them to the clinic for treatment. The nurse will treat them or give them prescription and send them home". Sarian stated, "When children have malaria, parents will give them agbo at home and don't take the children to the

hospital. Depending on the financial status of the parents, private tutoring was an option for children with malaria." Omo explained that

> We give them agbo when they are sick because sometimes the medications from the clinic give them diarrhea. Children miss school a lot when they have malaria…You cannot send them to school when they are weak and have fever…Sometimes if you pay the teachers, they will provide lessons for the children at home if the children cannot go to school… but not everyone can afford lessons."

Q31: What do pregnant women do to prevent or treat malaria? Participants were not aware of malaria preventive measures for pregnant women. This notion was summarized by this statement from Phyllis "Pregnant women don't take anything for malaria…doctors will tell pregnant women not to take anything… some will take local herbs like agbo." Theodora added that "From this village, most pregnant women only go to the hospital once or twice before they deliver, and they don't take anything for malaria." Ola expressed her belief that "Pregnant women cannot take medicines like quinine, it is not good for the baby…They can only take agbo…and drink *ageeree* or *broomstone*. Some use mosquito nets it they can afford." The general knowledge was that pregnant women drank agbo if they had malaria. Financial affordability determined the use of ITNs by pregnant women.

Research Question 3

RQ3: What are the perceptions of these women about the social, cultural beliefs, traditions, norms, and religious affiliations that influence the local treatment and prevention of malaria?

Theme 1: Malaria treatment, cost, and traditional herbs.

Q17: From your opinion, what are some of the malaria treatments that you believe are beneficial? As participants described their social and cultural beliefs about malaria, the usefulness of traditional herbs such as *ageeree, broomstone*, and lemon grass was emphasized. Susan stated,

> We know agbo works. People believe in them…there are several types of agbo for malaria, *ageeree* is good, broom stone is also good…when you drink them, you will pee a lot and the urine is yellow…that is the sickness leaving your body…after taking *ageeree* and *broomstone* for few days, you feel better. Lemon grass tea made is also good, especially if people don't have appetite to eat.

Although participants described their dependency on traditional herbs for malaria, they indicated that they would combine herbs with Western medicines for severe and persistent symptoms.

Q20 and 22: Do you or people you know have any traditional or cultural beliefs about malaria? If so, what are they? Many participants felt that malaria was a "normal" disease and believed that traditional herbs were useful. Ayo stated that "People are used to malaria and they believe that drinking agbo will prevent them from suffering from malaria." Joko added that "People in the villages will drink agbo regularly and if you

have malaria, sweating out is part of the treatment…they will bathe you with herbal leaves." Cultural beliefs were related to the use of traditional herbs that were specific by tribes. Sarian explained that "Everybody from every tribe drinks agbo for malaria… the Creoles like *ageeree, broomstone*, and lemon grass and the people from the provinces drink agbo from other herbs…. people from all tribes believe in drinking agbo for malaria." In short, Josephine said "Everybody can get agbo even if they don't have money…. Our people know the leaves that work, they know what to give to children, women and men and even pregnant women". This notion confirmed the common belief that no one was exempted from drinking traditional herb.

Theme 2: Malaria in children and in pregnancy.

Q21: Is malaria common among children? If so, how are the children treated for malaria, and does it affect their schooling? In addition to free treatments being provided for children under the age of five by the government, participants stated that traditionally, children were given agbo to prevent and treat malaria. Ola stated that, "Grandparents strongly believe in treating malaria with herbs, especially for children…children are given special herbs to drink at the end of summer holidays before going to school to prevent against malaria." Theresa stated that "Some people don't believe in giving children Western medicines for malaria, they prefer agbo, saying that the Western medicines are too strong for children." Joko echoed the fact that "In the villages, children are given agbo every weekend to clean their systems from diseases and prevent malaria." The participants unanimously expressed their common beliefs in giving children, especially school age children, local herbs to drink as a preventive measure

against malaria and other illnesses. Participants echoed the effectiveness of traditional herbs.

Q31: What do pregnant women do to prevent or treat malaria? The popular response was that pregnant women only drank agbo if they had malaria. Cecilia stated "Normally, pregnant women can't take anything for malaria because of the baby…doctors will tell them not to take anything…but they generally drink agbo." Becky summarized her response in these words

> Traditionally, we believe in our local herbs. Old people from the villages know the type of herbs for pregnant women because of the baby. In the villages, as soon as someone gets pregnant, they will start taking agbo to protect the pregnancy. Normally if you drink the herbs regularly, it can prevent malaria but if you only drink it when you are sick, it will take a long time to get better, but it works.

Theme 3: Use of ITN.

Participants were aware of the purpose of mosquito nets. However, when describing their experience with the use of ITNs, participants unanimously expressed the inappropriate or lack of use of ITNs for several reasons. Many participants preferred spending money on food and not on ITNs. According to Lara "People cannot afford to buy mosquito nets…during the rainy season the government will distribute mosquito nets but not everybody gets one…those things are expensive."

Q11: What do you believe can be done to prevent malaria? In addition to clean environment, participants identified mosquito nets as a malaria-preventive measure promoted by health officials. According to Cecilia, "health officials have been

encouraging people to use mosquito nets to protect against malaria, but normally, people don't use them…. some people just don't like them." Josephine summarized her response in these words:

> Some people use mosquito nets instead of mosquito spray because the sprays are too costly…one can of spray last for about three days. During rainy seasons government workers goes around to talk to people about using mosquito nets to prevent malaria …. But for some people, the heat is the problem and they cannot afford them all the time. Traditionally, most people don't believe in nets. People feel that keeping the environment clean and keeping the widows close will keep the mosquito away."

Q15: What are your beliefs about the use of mosquito nets? Common reasons outlined for not using ITNs included hot temperature, inconvenience, cost, and people being uncomfortable. Cecilia said, "mosquito nets alone cannot prevent someone from getting malaria, people don't have nets for every room, some people feel nets are waste of time." Beatrice said, "I don't like those things. Sleeping under mosquito nets is uncomfortable…people sometimes use the mosquito nets as window curtains or place them on doors as decoration." Ola stated, "At one time, the government sent mosquito nets to the health clinics, but the workers took them and sold them or gave them to their relatives." Theodora added that "People don't use the mosquito nets because it is too hot in the house and sometimes people sell them and use the money to buy food." Ayo stated that "Mosquito nets are not generally helpful because if you are outside, the mosquitoes

will bite you." The feelings expressed by participants about ITNs demonstrated poor compliance with the use of ITNs.

Trustworthiness of Data

The first evidence of trustworthiness was demonstrated by the pilot study which proved that the research instrument was appropriate because it provided the information necessary to answer the research questions. During the interview, I engaged in prolonged conversations with the participants, allowing them to provide detailed expressions of their experiences with malaria. I established clarity during the interview when necessary and included direct quotes in the result.

Transferability

To accomplish transferability in the study I described the research method, data collection procedures, and results from the data collected. I applied the phenomenological approach to explain women's perceptions on malaria and the factors that influence their prevention and treatment measures for the disease. I achieved dependability by providing a detailed breakdown of the results of the interview including direct quotes.

Credibility

Prolonged engagement with the participants was necessary to establish credibility. I engaged fully in the study by recording the interviews and took field notes which were transcribed and analyzed. Additionally, credibility was achieved by ensuring that the study focused on its purpose which was on exploring the perception of the study participants on malaria. The approach of the study afforded me the possibility to capture the experience and perception of women on malaria preventive and treatment measures as

expressed by the participants. I ensured that my own perception of malaria and my personal bias did not interfere with the interview process. To achieve this, I remained objective throughout the interview process, probed to gain clarity, made notes of the participants' tone and body language as they described their experiences on malaria. Data analysis was initiated during the interview process to ensure that the data were pertinent to the study. Careful analysis of the data was necessary to ensure consistency and to determine the data saturation point.

Reflexivity

My experiences before and during the research have shaped my perspective and knowledge not only on the subject matter, but also about the women from the rural area of Freetown. Additionally, I am originally from this village and have had interactions with women from the village, although not this population. My awareness of the cultural norm of the village, although not with the participants of this study, heightened my familiarity with the culture of the participants before collecting the data. Carroll (2013) explains that through reflexivity, "researchers acknowledge that their actions, emotions, and decisions impact the meaning of context of the investigated experience" (p.551). I share the notion that the emotional nature of the phenomenon being studied will galvanize the analytic insight of the results (Fitzpatrick & Olson,2014).

Summary

In this chapter, I provided an analysis of the data collected and a description of the participants' perceptions on malaria prevention and treatment measures. The interview questions provided information that derived themes to answer the research questions.

Women from a western rural village who have taken care of someone with malaria or knew of someone with malaria participated in the study. There were variations in the depth of the interviews and several themes emerged from the participants' stories that provided rich materials to address the research questions. To gain an in-depth understanding of women experiences with malaria and describe their experiences, three research questions were designed to address the perception of women in Wilberforce toward malaria. Several themes were identified for each research question. These research questions and related themes were:

RQ1: What is the experience of women with malaria? The themes identified for this research question are: malaria treatment, cost, and traditional herbs; government clinics; unavailability of medications and doctors; malaria causes and environmental conditions; and malaria symptoms and severity.

RQ2: What do the women of the rural area of Sierra Leone know about causes and treatments for malaria? The related themes for this research question are: malaria causes and environmental conditions; malaria treatment, cost, and traditional herbs; unavailability of medications and doctors; and malaria in children and pregnancy.

RQ3: What are the perceptions of these women about the social, cultural beliefs, traditions, norms, and religious affiliations that influence the local treatment and prevention of malaria? The themes that emerged to address this research question are: malaria treatment, cost, and traditional herbs; malaria in children and pregnancy; and the use of ITNs.

Summary of Results

Below are the results of the study according to identified themes. The information from the participants responses were categorized into themes and then summarized. The results are presented under themes, showing the correlation between the themes and the summarized results.

Theme 1: Malaria treatment, cost, and traditional herbs.

1. The use of traditional herbs was prevalent because of affordability, easy access, no experience of side effects, and trust. Additionally, participants trusted the use of *ageeree* and *broomstone* because of their proven effectiveness in treating malaria.
2. Although malaria treatment was fundamentally dependent on traditional herbs because of affordability, it was not uncommon for the economically advantaged, who are few, to proceed with the medications provided by private doctors.
3. For severe malaria, individuals would seek Western medicines. In some cases, individuals who cannot afford to buy the full quantity of medications prescribed would alter the treatment plan by buying few medications and combine the treatment with *ageeree* or *broomstone*.

Themes 2 and 3: Government clinics and unavailability of medications and doctors.

1. All participants were aware of the existence of government clinics in communities, but the lack of doctors, medicines, and malaria testing materials at those clinics discouraged malaria victims from visiting government clinics.
2. Participants stated that the government provides malaria treatment for all children below the age of 5 years, but the medications and testing materials were sold out or taken home by the nurses. The nurses would take these medications and testing materials home to treat patients privately at home for a fee.

Theme 4: Causes of malaria and environmental conditions.

1. Participants identified mosquito bites as the primary source of malaria**.**
2. The poor environmental conditions reflected in dirty gutters and dirty living conditions during the rainy seasons were identified as significant factors contributing to the malaria prevalence in the region.

Theme 5: Malaria symptoms and severity.

1. All participants were familiar with the common symptoms of malaria. Participants emphasize that poor environmental conditions that provide breeding grounds for mosquitos are a common cause of malaria.
2. Anytime someone had fever or complained of malaise it was related to malaria.

3. The general knowledge was that malaria was a deadly disease though it was considered normal.

Theme 6: Malaria in children and pregnancy.

1. Participants reported that parents were reluctant to take their sick children to government clinics, and in rear occasions when the malaria symptoms were severe parents went to private doctors.
2. They added that children missed schools because of malaria and, in some cases, die from the disease. With no help from government clinics, parents provide local treatments at home that may not be appropriate for severe malaria. Many parents could not afford to buy the drugs prescribed by private doctors.
3. The participants were not aware of any malaria preventive measures for pregnant women.

Theme 7: Use of ITNs.

1. The use of ITNs was not widespread because of the hot temperature, cost, and the general feeling of discomfort when sleeping under ITNs. It was not unusual for women to inappropriately use the ITNs as decorative window curtains instead of hanging the nets around the beds.
2. With limited financial resources, individuals would choose to buy food as a priority over buying mosquito nets.

In Chapter 4, I provided the result of the study and an analysis of the information provided by the study participants. Themes were derived from the responses to the

interview questions, and these themes related to the research questions. The findings were outlined according to related themes. In Chapter 5, the last chapter, I will provide a discussion of the study to include an interpretation of the findings considering the research questions. Other components of Chapter 5 will include the limitations of this study, recommendations for future study, implications for social change, and an overview of the dissemination of the study findings.

Chapter 5: Discussion, Recommendations, and Conclusion

Introduction

The purpose of this phenomenological study was to explore and describe the experiences of women with malaria and the factors that influenced their decisions on malaria prevention and treatment. The study described women's perceptions of malaria and their knowledge about preventive and treatment measures for the disease. Fifteen participants volunteered for the study and, through a face-to-face interview, described their experiences with the disease. Through analytical induction and embedded in the theory of health belief knowledge, participants' perception of malaria is described to contribute to the knowledge about the current phenomenon. In Chapter 4, I analyzed the data, which were presented in themes derived from the information provided by the participants. Chapter 5 contains a discussion of the study findings, including themes pertaining to the research questions, the relationship of the themes to existing literature, and recommendations for leaders and future research, followed by the study's limitations. I also provide implications for social change and a conclusion.

The women who volunteered for this study included those who had taken care of someone with malaria or knew someone who had malaria. Women who had suffered from malaria were excluded from the study. The research incorporated concepts and meanings grounded in the data to answer three research questions. The first research question was the following: What is the experience of women with malaria? The second research question was as follows: What do the women of the rural areas of Sierra Leone know about causes and treatments for malaria? Finally, the third research question was

the following: What are the perceptions of these women about the social and cultural beliefs, traditions, norms, and religious affiliations that influence the local treatment and prevention of malaria? The findings of the study were analyzed within the constructs of the HBM. In this chapter, the findings of this study are compared to current literature to expand knowledge on malaria from the perceptions of women from a rural village in Sierra Leone.

Interpretation of Findings

It was noted that cultural beliefs regarding the cause and treatment of malaria were related to mosquito bites, with first-line treatments frequently based on traditional practices. Participants in the study had similar responses to the interview questions with overlapping and repeated themes as they recalled detailed information to answer the research questions. From the information provided by the participants, several themes emerged for each research question. Themes were derived based on the similarity of meanings of words and phrases. The themes identified for this study included unavailability of medications and doctors; malaria treatment, cost, and traditional herbs; government clinics; malaria causes and environmental conditions; malaria symptoms and severity; malaria in children and in pregnancy; and the use of ITNs.

Comparisons of the derived themes to current literature shed some light on the study participants' perceptions of malaria. Additionally, these themes shed light on the factors that influence the health behavior of women as it pertains to malaria prevention and treatment measures. These findings highlight the challenges and concerns expressed by the participants on malaria control efforts. These factors could lead to

recommendations for evaluating and monitoring existing malaria programs in rural communities. The participants expressed the need for a robust government-funded malaria program; this community would also benefit from additional education on malaria prevention and treatment measures.

Literature and Study Findings for Research Question 1

RQ1: What is the experience of women with malaria?

Malaria is viewed as a deadly disease, with the primary treatment being traditional herbs. In describing their experience with malaria, participants emphasized the use of traditional herbs as the treatment of choice. Many participants believed that the unavailability of medications and doctors in rural communities prompted citizens to use traditional herbs as first-line treatment for malaria. Participants referred to the affordability, accessibility, and availability of traditional herbs as factors that determined their treatment approach toward malaria. This belief mirrors the experiences described by Shah, Emina, Eckert, and Ye (2015) in their study on access to effective malaria treatment among children under 5 in SSA. These authors added that villagers resorted to traditional herbs to treat illnesses because of unavailability of medications in government health clinics and because of experiences with traditional antimalaria medicines (Shah et al., 2015). The relative scarcity of medical resources and ingrained cultural beliefs are the driving forces that prompt rural Sierra Leonean communities to be heavily reliant on traditional medicine. Most importantly, many of the participants believed that these herbs and traditional methods could address their malaria problems. This belief is in alignment with current literature. Several researchers have confirmed that insufficient clinical

services in rural areas and beliefs about traditional medicines guide health behaviors in many rural regions in Africa (Mwanje & Comm, 2013; Nyarko & Cobblah, 2014). Likewise, it was noted in Kenya that malaria patients and caregivers relied on traditional and cultural practices to treat illnesses associated with severe malaria (Nguta, Mbaria, Gakuya, Gathumbi, & Kiama, 2015).

Furthermore, the participants perceived that the government and the citizens had different views on malaria treatments in government clinics, which contributed to the poor outcomes of malaria in the region. This was consistent with the study findings of Breman, Alilio, and Mills (2014), whose participants indicated that systematic disconnections between public health officials and ordinary people in many African countries contributed to negative health outcomes within communities. This notion was also confirmed by a study conducted by Jombol et al. (2013) that encouraged African governments to promote collaboration of all stakeholders in addressing malaria control and prevention. Jombol et al. reported that women perceived that the mismanagement of medical resources in health clinics was considered a letdown for ordinary citizens.

Participants stated that many people cannot afford the excessive costs for Western medicines for malaria, leading to self-medication with alternatives and reduced dosages, which, in turn, caused complications of the illness. This perception is reflected in current literature. According to Jombol et al. (2013), the excessive cost of malaria interventions creates a financial burden on the poor, making it impossible to adhere to treatment measures. In a study of socioeconomic factors in malaria in Uganda, Ricci (2013) discovered that because of financial constraints, the indigenous populations of Africa

were reluctant to buy antimalaria drugs or abide by prescribed treatment plans and instead engaged in alternate treatment approaches. This notion has been confirmed by economists who have claimed that poverty is a significant determinant of malaria, with the disease outcome being influenced by financial constraints (Ingstad, 2012; Somi et al., 2014).

Literature and Study Findings for Research Question 2

RQ2: What do the women of the rural areas of Sierra Leone know about causes and treatments for malaria?

Women from the rural areas of Sierra Leone recognized the direct relationship between mosquito bites and malaria. These women believed that dirty environmental conditions, swamp areas, clotted gutters, and collection of water in open containers in compounds provide breeding sites for mosquitoes, especially during the rainy season. This perception aligns with the research finding that stagnant patches of water, canals, and clogged ditches are ideal locations for the development of mosquito larvae (Endo & Eltahir, 2016; Sewe et al., 2016). This is also the belief of Mabaso and Ndlovu (2014) and Endo and Eltahir (2016), whose study findings demonstrated that in swamp areas, the *Anopheles* mosquitos can breed easily, increasing the transmittal of the parasite. In addressing climate's effect on malaria, Jackson et al. (2015) noted that heavy rainfalls and seasonal flooding in Africa foster favorable conditions for malaria transmission year-round. Participants felt that the government should have measures in place to keep the environment clean; enhance the campaign against malaria, especially during the rainy season; and promote community education on malaria prevention. Participants stated that

ITN usage was minimal because of discomfort from heat and affordability. This notion has been affirmed in other malaria studies. In evaluating the use of ITNs in rural Africa, Thiam et al. (2013) and Maslove et al. (2015) highlighted barriers to the use of bed nets including cost and heat-related problems associated with sleeping under bed nets.

These women expressed their strong beliefs in the use of traditional herbs, stemming from years of use and accessibility. These traditional herbs were either consumed orally or used as bathing solutions. This concept was affirmed in the study findings of Bell and Winstanley (2015) and David et al. (2014), who explained the use of traditional healing methods, herbal remedies, sponging and bathing, and various forms of fumigation as first-line treatments for malaria. Other researchers have also highlighted reliance on knowledge handed down from previous generations regarding traditional herbs to treat malaria (Goldberg, 2012; Houngbedji et al., 2015; William et al., 2009). Although traditional herbs are highly recognized as treatment measures for malaria, future studies on the effectiveness of traditional herbs used to treat malaria in Sierra Leone are necessary and recommended. Studies on the effectiveness of traditional herbs could acknowledge the antimalarial properties of these plants, thereby leading to the development of health policies that advocate their appropriate use.

Very little emphasis was given to the use of Western medicines to treat malaria. Participants identified some of the Western medicines for malaria but noted that cost and unpleasant side effects were major concerns. However, they agreed with Adeneye et al. (2013), whose study discovered that combining local herbs and Western medicines to treat severe malaria in adults and children was not uncommon in many African countries.

In addressing malaria in pregnancy, it was evident that the women were not aware of any malaria-preventive measures during pregnancy. They believed that physicians forbade pregnant women from taking prescribed drugs during pregnancy and that pregnant women therefore resorted to traditional herbs for malaria if needed. A similar concept was discussed by Karunamoorthi, Deboch, and Tafere (2013). In research on knowledge and practice concerning malaria among pregnant women in SSA, Karunamoorthi et al. (2013) noted that pregnant women refrained from taking medications during pregnancy and were unaware of recommended malaria-preventive measures for pregnancy. Anders et al. (2014) described a similar perception of women from the rural region of northern Tanzania who expressed total reliance on traditional herbs during pregnancy.

Literature and Study Findings for Research Question 3

RQ3: What are the perceptions of these women about the social and cultural beliefs, traditions, norms, and religious affiliations that influence the local treatment and prevention of malaria?

The third research question was designed to capture the general outlook on social, cultural, and traditional norms about malaria prevention and treatment measures in rural Sierra Leone from a woman's perspective. In describing the social and cultural norms of malaria prevention and treatment measures, the women from the rural region of Sierra Leone emphasized the importance of, reliance on, and dependence on traditional herbs. As mentioned earlier, the treatment measure for malaria was based on availability, accessibility, and affordability. Therefore, the first-line treatment measures were traditional herbs. This notion is in alignment with results from malaria studies conducted

by Bell and Winstanley (2015) in which participants described traditional herbs as the primary and only treatment for malaria for residents of rural villages in Africa. Similar findings on reliance on traditional herbs as the treatment of choice for malaria in many sub-Saharan African countries were presented by Boene et al. (2014), Breman (2013), and Silva and Marshall (2012).

While describing their experiences with the disease, the women in my study affirmed the findings of previous researchers that the use of ITNs was rare, secondary to cost and ease of use (Karunamoorthi et al., 2013; Loll et al., 2014). In reviewing the evidence of the economic impact of malaria in Africa, Chima et al. (2013) found that individuals avoided using ITNs because of difficulty in setting them up and, in some cases, lack of knowledge on instructions for doing so. Furthermore, the norm for malaria was to initiate treatment with herbs and seek medical advice if symptoms persisted. This behavior is not uncommon in many African countries. According to Bauch et al. (2013), malaria victims from Zambia initiated herbal treatments for malaria with the onset of symptoms.

When participants were asked about religious influences on malaria treatment, the overall response was negative. In their experience, there were no religious beliefs or norms associated with malaria. This overall perception of the dissociation between religious beliefs and malaria was contrary to current beliefs expressed in the literature. A review of the sociodemographic determinants of malaria among under-5 children in Ghana revealed that the religion of the caregiver has a significant effect on both prevention and treatment (Ceesay et al., 2015; Nyarko & Cobblah, 2014). The association

between religion and malaria treatment was also described in studies on malaria-associated health seeking behavior in parents and healthcare providers, in which religion played a role in malaria treatments for children and pregnant women (Maslove et al., 2015; Mitiku & Assefa, 2017).

Theoretical Foundation

The HBM indicates that human health behavior is influenced by a person's beliefs and perceptions about a disease. These perceptions, identified as constructs of the model, include perceived susceptibility**,** perceived severity, perceived benefit, perceived barriers, cues to action, and self-efficacy (Glanz et al., 2015). In this study, the constructs of the HBM were applied to understand and describe the perceptions and malaria experiences of the participants. The experiences were described by various beliefs that guided the health behavior of the participants.

Perceived susceptibility, severity, and cues to action. From the explanations provided by the participants, perceived susceptibility to the disease and perceived severity of the illness was associated with participants' decisions to initiate treatment with local herbs. Because of their perceived susceptibility to malaria, drinking agbo as a malaria-preventive approach was habitual for some of the participants. Additionally, the perceived severity of the disease, cues to action, and perceived benefits were associated with the health-seeking behavior of combining local herbs with Western medicines. In a qualitative study to identify factors associated with treatment-seeking behaviors for malaria in urban poor communities in Accra, the author applied the theory of HBM to describe the factors that influenced health behaviors (Awuah et al., 2018). The author

discovered that the decision of Ghanaian caregivers in response to malaria was influenced by the perceived susceptibility and severity of the disease, as well as other cultural factors. Additionally, alternative treatment options for malaria were linked to the perceived benefits from those options and to the perceived barriers to treatment from health clinics (Awuah et al., 2018).

In another study that examined the systematic approach to identifying synergistic drug combinations against malaria, application of the HBM revealed that perceived susceptibility, severity, and cues to action influenced the health-seeking behaviors of the participants (Motamedi, Eastman, Guha, & Bender, 2018). Moreover, in a qualitative study involving focus group discussions and in-depth interviews, theoretical concepts from the HBM were used to examine the motivations for malaria self-care among the adult population in Tanzania (Metta et al., 2014). Analysis of the study revealed that perceived susceptibility, perceived severity, and cues to action described by the worsening of disease symptoms, poor access to health clinics, and costs associated with health facilities motivated participants to seek self-care (Metta, Haisma, Kessy, Hutter, & Bailey, 2014).

Perceived barriers and perceived benefits. This study revealed that the treatment approach to malaria is a complex process characterized by different actions, underlined by the perceptions of the caregiver. The participants perceived that the unavailability of medical resources in health clinics was a challenge that posed barriers to malaria treatments. Additionally, the cost of ITN, hot temperature, and the discomfort from sleeping under ITNs were perceived barriers that deter the use of mosquito nets.

Participants indicated that the perceived benefits of traditional herbs guided the health behavior of relying on traditional herbs to treat mild and severe malaria. A similar observation was made from a meta-analysis of 32 national cross-sectional datasets in Africa, in which the authors analyzed health-seeking behaviors for malaria prevention in pregnancy using the HBM. The authors discovered that caregivers' perceived susceptibility to malaria and perceived barriers to receiving treatment were factors associated with the health-seeking behaviors (Eisele et al., 2012).

This perception is echoed in a study by Mitiku and Assefa (2017), in which the authors applied the constructs of the HBM to analyze caregivers' perceptions of malaria and treatment-seeking behavior for under 5 children in West Ethiopia. The study concluded that caregivers from rural areas in Uganda and Kenya perceived the poor access to malaria clinics as perceived barriers to receiving treatment which determined their health-seeking behavior for children under 5 and infants (Mitiky & Assefa, 1017). Furthermore, in a quantitative study to examine the patterns of age-specific mortality in children in malaria-endemic areas of SSA, the authors applied the constructs of the HBM to determine the health behavior of the participants. It was discovered that the lack of services from health clinic was a perceived barrier associated with the cues to action that promoted the health-seeking behavior of treating malaria with traditional herbs (Metta et.al., 2014). In 2015, Oyekaleto (2015) applied the theory of HBM to assess Malawian mothers' knowledge, healthcare preferences, and timeliness of seeking fever treatments for children under five. He concluded that the decision of households to treat malaria symptoms was influenced by the perceived susceptibility to malaria, the perceived

severity of the illness, the perceived barriers to treatment or benefits from treatments, and other cultural factors (Oyekaleto, 2015).

Limitations of the Study

Prior to conducting this study, several limitations were identified to include the study population and the sampling technique. To ensure trustworthiness, I was aware of my familiarity with the culture of the participants and had to remove myself from their experiences. My focus was on the information being shared as they described their experiences with the disease. Although men also suffer from malaria, this study was limited to women from a specific location, which further limits its generalization. Additionally, as the sole researcher conducting the study, data analysis and interpretations are limited to this single researcher. This study was limited to 15 participants who shared their experiences with malaria prevention and treatment measures. Exploration of this phenomenon could be elaborated by expanding the eligibility criterion to include other participants to increase the number of voices on this phenomenon.

Recommendations

Recommendations for Future Research

This qualitative study focused on women's perception on malaria prevention and treatment measures from the western rural area of Sierra Leone. Fifteen women told their stories by describing their experiences with the disease, emphasizing the reliance on traditional herbs as first-line treatment of choice. The common herbs identified by the study participants were *ageeree* and *broomstone.*

Recommendation 1: Considering the reliance on traditional herbs to treat malaria, it is my recommendation that future studies be conducted on the effectiveness of local herbs such as *ageeree* and *broomstone* to treat malaria in Sierra Leone. If the scientific study of these herbs shows any degree of antimalaria properties, their use, access, and sustainability should be advocated by the Sierra Leone Health Ministry and other global health communities. The information gained from the recommended research may provide an innovative approach to developing a model for inclusion of traditional herbs in the Sierra Leone health system. For over a decade, the World Health Organization (2002) has advocated the use of traditional medicine. However, the Sierra Leone health system has yet to advocate for the inclusion of traditional medicines in its approach toward eradicating malaria. Therefore, any information from research that could guide the decision-making of public health officials in Sierra Leone toward advocating for an inclusive evidence-based scientific approach to the eradication of malaria could be beneficial to the health outcome of the nation.

Recommendation 2: That the national public health authorities review and, if appropriate, advocate for the inclusion of traditional medicines in its approach toward eradicating malaria. The data revealed that participants found traditional herbs to be effective in treating malaria.

Recommendations for Policy Makers

The women in the study are aware of the health programs for malaria proposed by government officials but unanimously expressed the lack of doctors, medications, and malaria testing supplies at health clinics

Recommendation 1: That the national public health authorities review the availability of doctors, medications, and testing kits at rural clinics and, set up a system for monitoring this availability in the future.

Recommendation 2: That government officials improve public health services in rural regions by providing health professionals on a regular basis as well as furnishing and monitoring malaria medicines and testing kits.

The data demonstrated that the continued use of traditional medicine as first-line treatment for malaria is prevalent. People trust herbal medicines because they are, available, affordable, and effective. The belief expressed was that "The health clinics are the last choice for treatment." In their writings, Jain et al. (2015) noted that the current malaria control efforts in Sierra Leone include the use of an artemisinin-based combination therapy with the first-line treatment for uncomplicated malaria being artesunate-amodiaquine (AS+AQ) and artemether-lumefantrine (AL) in cases of contraindications. However, this is contrary to the experience of the participants who expressed a profound dependence on traditional medicine as first-line treatment for malaria.

Recommendation 3: That public health officials evaluate the current environmental conditions, especially the poor drainage conditions identified by the participants and target interventions to address the problem. Participants clearly expressed their frustrations with dirty environmental conditions evidenced in dirty gutters, and poor drainage systems that favor mosquito breeding. This feeling corroborates with the findings of Sewe (2016) that malaria incidence increases for

households near swampy areas, and pools of water provide suitable breeding sites for vectors. The inclusion of environmental initiatives that address clean gutters and adequate drainage systems in public health programs is a social change initiative that could lead to improvement in malaria outcomes.

Recommendation 4: That government officials provide a comprehensive malaria education program to the public to address the importance of compliance to prescribed treatment measures. The cost of medicines and intolerable side effects deter participants from adhering to the malaria-prescribed treatments. Prescribed treatments were altered. In some cases, prescribed treatments were ignored.

Recommendation 5: That government officials provide a robust malaria education program for pregnant women. The women were unaware of the malaria preventive measures during pregnancy. The general knowledge is that pregnant women did not take any medication because it was unsafe for the baby. It was also noted that if pregnant women had malaria, local herbs such as *ageeree* and *broomstone* were the treatment of choice. Current literature promotes the inclusion of educational activities in comprehensive malaria programs in endemic regions to reduce the prevalence of malaria and evacuate the disease (Breman et al. 2014; Shah, 2015).

Recommendation 6: That government officials evaluate and monitor the distribution of ITNs. Additionally, on-going education on the purpose and use of ITNs by public health officials especially during the rainy seasons is recommended. The use of ITNs was not widespread. Participants were aware of the purpose of mosquito nets

but identified cost, hot temperature, and inconvenience as reasons for people not using them. Moreover, the distribution of ITNs by the government was not supervised.

Implications for Social Change

Women from a western rural village were provided an opportunity to describe their experiences with malaria prevention and treatment measures. Malaria in Africa is a serious public health problem with devastating health implications (Eisele et al., 2012). Despite the numerous studies that have been conducted to address the malaria prevalence in Africa, the incidence rate of malaria in this continent remains high (Arori, 2011; Goldberg, 2012; Nsimba & Kayombo, 2008). Malaria is a disease that warrants continuous attention because of its devastating impacts on vulnerable populations like women and children, especially the women from rural regions of Sierra Leone. This study provides an alternative approach to understanding the social, cultural, environmental, and traditional norms toward malaria prevention and treatment.

The information gained from this study will be shared with local and international stakeholders with the hope that public health officials, not just in Sierra Leone, but all over the world will gain an insight on how women from rural areas view already implemented malaria control measures. Through research, health officials can develop comprehensive strategies to maximize the opportunities to effect changes in health behavior (Glanz, et al. 2015). This study found that women from rural villages have a high dependence on traditional medicines as first-line treatment for malaria because of affordability, availability, and accessibility. Understanding the

reasons for health behavior could direct health practitioners to incorporate current knowledge and develop health initiatives that could lead to changes in behavior and improvement in health outcomes. Moreover, public health officials are encouraged to provide comprehensive education to the public regarding malaria prevention and on the importance of following through with prescribed treatment measures. Dodman and Mitlin (2013) affirmed that information provided through research can lead to health education aimed mainly at changing individual behavior and lifestyle to effect positive health behavior. Women in this study responded that they were the primary care-takers of their families. It is incumbent upon public health officials to work with women in the community and educate them on the importance of adhering to prescribed malaria treatments and incorporating health behaviors to prevent malaria. Improvements in health education, behavior, and level of awareness constitute social change (Kegan, & Lahey, 2009).

Furthermore, public health officials are encouraged to monitor and evaluate the effectiveness of existing malaria programs in rural areas by establishing measures of accountability. The participants expressed a complete lack of trust in the current health care system in the village for reasons such as poor staffing, inadequate supplies, and the clinics being closed. These concerns warrant further evaluation of existing health programs to determine their efficiency and effectiveness in meeting desired health outcomes. Through program evaluation, policy makers and stakeholders can determine the effectiveness of health programs and the need to enact new policies to improve program goals and health outcomes (Fertman & Allensworth, 2010).

Additionally, this study offers public health officials the opportunity to address issues related to sanitation in rural villages in Sierra Leone. Participants were concerned that the poor environmental conditions especially in swamp areas and during the rainy seasons were creating breeding grounds for mosquito. Addressing the social determinants of health which includes environmental factors are significant in effecting health outcomes (Jackson et al., 2015; Silal et al., 2012). Likewise, establishing comprehensive education programs in communities to empower women on malaria control measure is vital in the fight to eradicate malaria (Houeto et al.,2013; Jambo, Araoye, & Damen, 2011).

Dissemination

To further effect social change, I will disseminate the findings of this study to public health officials in Sierra Leone to raise their level of awareness on the health concerns described by the women from a western rural village in Sierra Leone. The information will be accessible to the public at the Dissertations and Theses Library at Walden University. From the individual front, I plan to go home annually and provide health education seminars at local churches and schools to facilitate community discussions on health issues and promote community involvement in public health. I will also present my findings at the Women's Health Conference in Freetown, Sierra Leone, and provide poster presentations at the Krio Descendants Organization Conferences in Atlanta, North Carolina and California. Furthermore, I will submit articles about the study findings to health journals such as the Malaria Journal, American Journal of Public

Health, and The Journal of Public Health Research. Dissemination of research findings can take different approaches while serving as a tool to promote social change.

I sincerely hope that information from this study will guide public health practitioners, decision-makers, regulators, and other stakeholders in developing health policies and allocating scarce resources to affect malaria outcomes. By considering the health needs and concerns of community members, health officials can direct health initiatives that are meaningful and specific to community needs. Understanding a community's perceived health care needs is essential to the promotion of community health and social change (Edberg, 2007; Minkler, 2012). Improvement in health outcomes is a social change initiative that will impact global population health and especially the health outcomes from the citizens of Sierra Leone.

Conclusion

This research afforded me the opportunity to explore and describe malaria prevention and treatment measures from the perception of women from the western rural area of Sierra Leone. In describing their cultural beliefs and traditional norms about malaria, the focus was on malaria treatment with very little information provided on malaria prevention. Women are the primary care takers of the family and providing them with the appropriate information necessary for a comprehensive malaria control is vital. The current evidence-based approach recommends a comprehensive malaria control. This approach includes the combination of therapy that promotes the continuous use of durable insecticide nets, residual spraying, case management, and artemisinin-base therapy (Houngbedji et al., 2014). Public health officials are encouraged to work with

women in the community by providing them the necessary knowledge and resources to fight the deadly disease. Moreover, the citizens of Sierra Leone could benefit from a comprehensive malaria control approach that encompasses both prevention and treatment measures with continuous government oversite and evaluation.

Most importantly, governments officials must understand the lack of trust or faith in the current health systems as described by the participants who felt helpless and ignored. From this study, it was evident that the presence of health clinics in local villages was not an indication that the appropriate medical services were provided to local citizens. There were disparities in the health services believed to be provided by the government in health clinics and the available health services perceived by the participants. This study reveals the need for government intervention and concerted efforts to reduce the intolerable burden of malaria in resource-poor rural villages, where malaria continues to pose a challenge. Health clinics in rural areas in many SSA countries are pivotal in providing health care services to the economically disadvantaged through comprehensive community-based programs (Ingstad et al.2012; Lim et al., 2012; Nankabirwa et al., 2014). It is necessary for health officials to ensure the effectiveness of these services regularly. The health center can play a significant role in promoting and enhancing community malaria knowledge that includes prevention, diagnoses, and treatment through community engagement and empowerment. As the primary care takers in many African societies, empowering and educating women on malaria control measure is vital in fighting and eradicating malaria (Houeto et al, 2014; Karunamoorthi, et al., 2013).

Furthermore, this study was especially important as it provided information about malaria control measures from the voice of women from the western rural area of Sierra Leone. This study has shown that the malaria-treatment choice is motivated by people's perceptions of the disease and the available health care options. Malaria is a forgotten tropical disease that has claimed and continues to claim lives in many African countries. Public health officials are encouraged to revisit the current malaria programs in Sierra Leone to evaluate the effectiveness and efficiency of such programs. Malaria is a preventable and curable disease. However, factors such as limited resources, inadequate medical supplies, poverty, lack of education, ineffective health programs, poor accountability, and unhealthy environment are identified as negatively impacting the malaria control programs in the rural areas of Sierra Leone. The citizens of the western rural area of Sierra Leone are appealing to health care officials for additional resources to address their immediate health care and environmental concerns.

Public health is the responsibility of everyone including government officials, public health officials, businesses, community leaders, faith-based organizations, educators, and individuals (Minkler, 2012; Soriano, 2013). Community programs that incorporate local citizens in community-building efforts promote social change through community empowerment. To reduce the prevalence rate of malaria in rural regions and in Sierra Leone, it is imperative that government officials, public health officials, and all stakeholders, collaborate their efforts to improve malaria outcomes and effect social change. The women of the western rural area have described their challenges and problems experienced with eradicating malaria. This information represents a deficiency

in the current malaria control measures in Sierra Leone. Therefore, to reverse the malaria trend in the rural villages in Sierra Leone, health stakeholders must pay attention to the factors associated with seeking treatment for malaria and provide the resources necessary to empower local communities. Scaling up of malaria control programs with evidence-based comprehensive malaria prevention and treatment measures is essential to reduce the burden of malaria currently experienced by the citizens of Sierra Leone.

References

Abdullah, S., Adazu, K., Masanja, H., Diallo, D., Hodgson, A., Ilboudo-Sanogo, E., … Binka, F. N. (2014). Patterns of age-specific mortality in children in endemic areas of sub-Saharan Africa. *American Journal of Tropical Medicine and Hygiene*, *77*(6 Suppl.), 99-105

Adeneye, A. K., Jegede, A. S., Mafe, M. A., & Nwokocha, E. E. (2013). Community perceptions and home management of malaria in selected rural communities of Ogun State, Nigeria. *International Journal of Malaria Research and Reviews*, *1*(3)22-34

Alaba, O. A., & Alaba, O. B. (2009). AERC-Cornell Symposium on "Risk, Knowledge and Health in Africa": Malaria in Rural Nigeria: Implications for the Millennium Development Goals. *African Development Review/Revue Africaine De Developpement, 21*(1)73-78

Amuasi, J. H., Diap, G., Nguah, S. B., Karikari, P., Boakye, I., Jambai, A., . . . Kiechel, J. (2012). Access to artemisinin-combination therapy (ACT) and other anti-malaria: National policy and markets in Sierra Leone. *PLoS One, 7*(10). http://dx.doi.org/10.1371/journal.pone.0047733

Anchang-Kimbi, J., Achidi, E. A., Apinjoh, T. O., Mugri, R. N., Chi, H. F., Tata, R. B., … Troye-Blomberg, M. (2014). Antenatal care visit attendance, intermittent preventive treatment during pregnancy (IPTp) and malaria parasitaemia at delivery. *Malaria Journal, 13*, 162-168. http://dx.doi.org/10.1186/1475-2875-13162

Anders, K., Marchant ,T., Chambo, P., Mapunda, P., Reyburn, H. (2014). Timing of intermittent preventive treatment for malaria during pregnancy and the implications of current policy on early uptake in north-east Tanzania. *Malaria J*oirnal,7,79

Andrews, K. G., Lynch, M., Eckert, E., & Gutman, J. (2015). Missed opportunities to deliver intermittent preventive treatment for malaria to pregnant women 2003-2013: A systematic analysis of 58 household surveys in sub-Saharan Africa. *Malaria Journal*, *14*(5), 21 http://dx.doi.org/10.1186/s12936-015-1033-4

Arab, A., Jackson, M., & Kongoli, C. (2014). Modelling the effects of weather and climate on malaria distributions in West Africa. *Malaria Journal, 13*,126 http://dx.doi.org/10.1186/1475-2875-13-126

Arori, C. N. (2011). *Assessing the influence of socioeconomic factors, knowledge level, attitudes, and practices on malaria prevention among the Gusii people of Kenya* (Doctoral dissertation). Retrieved from Dissertations & Theses @ Walden University. (Order No. 3482756)

Awuah, R. B., Asante, P. Y., Sakyi, L., Biney, A. A. E., Kushitor, M. K., Agyei, F., & de-Graft Aikins, A. (2018). Factors associated with treatment-seeking for malaria in urban poor communities in Accra, Ghana. *Malaria Journal*, *17*,168

Bauch, J. A., Gu, J. J., Msellem, M., Martensson, A., & Ali, A. S. (2013). Perception of malaria risk in a setting of reduced malaria transmission: A qualitative study in Zanzibar. *Malaria Journal,12*(75)2-10

Baume, C., & Marin, C. (2011). Intra-household mosquito net use in Ethiopia, Ghana,

Mali, Nigeria, Senegal, and Zambia: Are nets being used? Who in the household uses them? *American Journal of Tropical Medicine and Hygiene,77*(5), 963-982. Retrieved from http://www.ajtmh.org/content/77/5/963.full

Bazeley, P. (2007). *Qualitative data analysis with NVivo.* Thousand Oaks, CA: Sage.

Bell, D., & Winstanley, P. (2015). Current issues in the treatment of uncomplicated malaria in Africa. *British Medical Bulletin*, *71*(1),29–43 https://doi-org.contentproxy.phoenix.edu/10.1093/bmb/ldh031

Berkman L., Glass, T., Brissette, I., & Seeman, E. (2005). From social integration to health: Durkheim in the new millennium. *Social Science and Medicine, 51*(5), 843–857. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/10972429

Bishop, D. B. (2012). The role of behavioral science theory in the development and implementation of public health interventions. *Annual Review of Public Health.* 21, 299–418. http://dx.doi.org/10.1146/annurev.publhealth.012809.103604

Black, R. E., Cousens, S., Johnson, H. L., Lawn, J. E., Rudan, I., Bassani, D. G., … Mathers, C. (2010). Global, regional, and national causes of child mortality in 2008: A systematic analysis. *The Lancet, 375*:1969-87

Boadu, K., & Trovato, F. (2016). Association of social class with malaria incidence among household heads in Ghana. *Canadian Studies in Population, 33*, 271–299

Boene, H., González, R., Valá, A., Rupérez, M., Velasco, C., Machevo, S., et al. (2014). Perceptions of malaria in pregnancy and acceptability of preventive interventions among Mozambican pregnant women: Implications for effectiveness of malaria control in pregnancy. *PLoS ONE, 9*(2), e86038.

http://dx.doi.org/10.1371/journal.pone.0086038

Breman, J.G., Alilio, M.S., & Mills, A. (2014). Conquering the intolerable burden of malaria: What's new, what's needed: A summary. *American Journal of Tropical Medicine and Hygiene,71*, 1-15

Burlando, A. (2015). The disease environment, schooling, and development outcomes: Evidence from Ethiopia. *Journal of Development Studies,51*(12), 1563-1584

Carias, C., Greening, B., Campbell, C. G., Meltzer, M. I., & Hamel, M. J. (2016). Preventive malaria treatment for contacts of patients with Ebola virus disease in the context of the west Africa 2014-15 Ebola virus disease response: An economic analysis. *The Lancet Infectious Diseases,16*(4), 449-458. http://dx.doi.org/10.1016/S1473-3099(15)00465

Carroll, K. (2013). Infertile? The emotional labour of sensitive and feminist research methodologies. *Qualitative Research,13*(5),546–561. doi:10.1177/1468794112455039

Ceesay, S. J., Koivogui, L., Nahum, A., Taal, M., Okebe, J., Affara, M....D' Alessandro, U. (2015). Malaria Prevalence among young infants in different transmission settings, Africa. *Emerging Infectious Diseases*, *21*(7),1114-1121. https://dx.doi.org/10.3201/eid2107.142036

Centers for Disease Control and Prevention. (2004). The History of Malaria, an Ancient Disease. http://www.cdc.gov/malaria/history

Centers for Disease Control and Prevention. (2007). Division of Parasitic Diseases. http://www.cdc.gov/malaria/facts.htm.

Centers for Disease Control and Prevention. (2010). Where Malaria Occurs. http://www.cdc.gov/malaria/about/distribution.html

Centers for Disease Control and Prevention. (2012a). What is malaria? http://www.cdc.gov/malaria/about/faqs.htm/

Centers for Disease Control and Prevention. (2012b). Biology of mosquito. http://www.cdc.gov/malaria/about/biology/index.html

Centers for Disease Control and Prevention. (2014a). Malaria facts. http://www.cdc.gov/malaria/about/facts.html

Centers for Disease Control and Prevention. (2014b). Disease. http://www.cdc.gov/malaria/about/disease.html

Centers for Disease Control and Prevention. (2015). Malaria. Malaria worldwide. Impact of malaria. http://www.cdc.gov/malaria/malaria_worldwide/impact.html

Chenail, R. J. (2015). Interviewing the investigator: Strategies for addressing instrumentation and researcher bias concerns in qualitative research. *Weekly Qualitative Report, 2*(3), 14-21. http://www.nova.edu/ssss/QR/WQR/interviewing.pdf

Chima, R. I., Goodman, C. A., & Mills, A. (2013). The economic impact of malaria in Africa: A critical review of the evidence. *Health Policy, 63*(1), 17-36

Chua, T. H. (2012). Modelling the effect of temperature change on the extrinsic incubation period and reproductive number of *Plasmodium falciparum* in Malaysia. *Tropical Biomedicine,* 29, 121-128

Collins, C. S., & Cooper, J.E. (2014). Emotional intelligence and the qualitative

researcher. *International Journal of Qualitative Methods, 13*(1), 88-103. doi 10.1177/160940691401300134

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd Ed.). Thousand Oaks, CA: Sage

Crosby, R., DiClemente, R., & Salazar, L. (2013). *Research methods in health promotion (Laureate Education, Inc., Custom Ed.*). San Francisco: Jossey-Bass

Davies, D., & Dodd, J. (2012). Qualitative research and the question of rigor. *Qualitative Health Research, 12*(2), 279-289

De Castro, M. C., & Fisher, M. G. (2012). Is malaria illness among young children a cause or a consequence of low socioeconomic status? Evidence from the United Republic of Tanzania. *Malaria Journal*, *11*, 161. doi:10.1186/1475-2875-11-161

DePaulo, P. (2013). How large should the sample size be in a qualitative study? DePauloResearch Consulting, Montgomeryvill http://www.quirks.com/articles/a20013/20131202.aspx?searchID=383113850

De Silva., P. & Marshall, J, (2012). Factors contributing to urban malaria transmission in sub Saharan Africa: A systematic review. *Journal of Tropical Medicine,* 1687-9686. doi: 10.1155/2012/819563

Devers, E. J., & Frankel, R. M. (2000b). Study design in qualitative research sampling and data collection strategies. *Education for Health,13*(2),263–271

Diiro, G.M. (2016). The role of gender on malaria preventive behaviour among rural households in Kenya. *Malaria Journal, 15*(1),14-18. doi: 10.1186/s12936-0151039-y

Dodman, D., & Mitlin, D. (2013). Challenges for community-based adaptation: Discovering the potential for transformation. *Journal of International Development, 25*, 640–659 doi:10.1002/jid.1772

Edberg, M. (2007). *Essentials of health behavior*: *Social and behavioral theory in public health*. Sudbury, MA: Jones and Bartlett

Edlund, S., Davis, M., Douglas, J., Kershenbaum, A., Waraporn, N., Lessler, J….Kaufman,J. (2014). A global model of malaria climate sensitivity: Comparing malaria response to historic climate data based on simulation and officially reported malaria incidence. *Malaria Journal, 11*(30), 2-16

Eisele, T. P., Larsen, D. A., Anglewicz, P. A., Keating, J., Yukich, J., Bennett, A. . . . Steketee, R. W. (2012). Malaria prevention in pregnancy, birthweight, and neonatal mortality: A meta-analysis of 32 national cross-sectional datasets in Africa. *The Lancet Infectious Diseases, 12*(12), 942-949 http://dx.doi.org.contentproxy.phoenix.edu/10.1016/S1473-3099(12)70222-0

Endo, N., & Eltahir, E.A.B. (2016). Environmental determinants of malaria transmission in African villages. *Malaria Journal, 15*:578. doi 10.1186/s12936-016-1633-7

Fertman, C. I., & Allensworth, D. D. (2010). *Health promotion programs: From theory to practice.* San Francisco, CA: Jossey-Bass

Fink, A. S. (2014). The role of the researcher in the qualitative research process. A potential barrier to archiving qualitative data. Forum: *Qualitative Social Research, 1*(3) Retrieved from https://search-proquestcom.contentproxy.phoenix.edu/docview/867756578? accountid=458

Fitzpatrick, P. & Olson, R. (2014). A rough road map to reflexivity in qualitative research into emotions. *Qualitative Research 7*(1), 49-54. doi:10.1177/1754073914544710

Fullman, N., Burstein, R., Lim, S. S., Medlin, C., & Gakidou, E. (2013). Nets, spray or both? The effectiveness of insecticide-treated nets and indoor residual spraying in reducing malaria morbidity and child mortality in sub-Saharan Africa. *Malaria Journal, 12,* 62. doi:10.1186/1475-2875-12-62

Gatton, M., Chitnis, N., Churcher, T., Donnelly, M., Ghani, A., J. Godfray, H., . . .Lindsay, S. (2013). The importance of mosquito behavioral adaptations to malaria control in Africa. *Evolution, 67*(4), 1218-1230. http://www.jstor.org/stable/23463873

Glanz, K., Rimer, B. K., & Viswanath, K. (2015). *Health behavior: Theory, research, and practice.* San Francisco, CA: Jossey-Bass

Goldberg, M. L. (2012). Fighting malaria in Liberia with UNITAID. Retrieved from http://www.undispatch.com/fighting-malaria-in-liberia-with-unitaid

Hagenlocher, M., & Castro, M. C. (2015). Mapping malaria risk and vulnerability in the United Republic of Tanzania: A spatial explicit model. *Population Health Metrics, 13*(1), 1-14. doi:10.1186/s12963-015-0036-2

Holmes, G. M., Slifkin, R. T., Randolph, R. K., & Poley, S. (2015). The effect of rural hospital closures on community economic health. *Health Services Research, 41*, 467–485. doi:10.1111/j.1475- 6773.2015.00497.x

Houeto, D., D'Hoore, W., Ouendo, E., Charlier, D., & Deccache, A. (2014). Malaria control among children under five in sub-Saharan Africa: The role of

empowerment and parents' participation besides the clinical strategies. *Rural and Remote Health, 7*(4), 840

Houngbedji, C. A., N'Dri, P. B., Hürlimann, E., Yapi, R. B., Silué, K. D., Soro, G., … Raso, G. (2015). Disparities of *Plasmodium falciparum* infection, malaria-related morbidity and access to malaria prevention and treatment among school-aged children: a national cross-sectional survey in Côte d'Ivoire. *Malaria Journal, 14,* 7. doi:10.1186/1475-2875-14-7

Ingstad, B., Munthali, A. C., Braathen, S. H., & Grut, L. (2012). The evil circle of poverty: a qualitative study of malaria and disability. *Malaria Journal,* 1115.doi:10.1186/1475-2875-11-15

Jackson M, Colson A, Johansen L, Furlong C, Sellers K. (2015). Modelling the effect of climate change on the prevalence of malaria in western Africa. *Statistica Neerlandica.* 64:388-400. 10.1111/j.1467-9574.2015.00453. x.

Jacob, S. A., & Furgerson, S. P. (2012). Writing interview protocols and conducting interviews: Tips for students new to the field of qualitative research. *The Qualitative Report, 17*(T&L Art, 6), 1-10. Retrieved from http://www.nova.edu/ssss/QR/QR17/jacob.pdf

Jain, V., Brown, C. S., & Johnson, O. (2015). Sierra Leone: The forgotten mortality. *Global Health Action, 8* doi: http://dx.doi.org/10.3402/gha.v8.26757

Jombol, G., Mbaawuaga, E., Anongu, S., Egah, D., Enenebeaku, M., Okworil, E….Odey, F. (2013). Africa's 9th malaria day celebration in 2009 and its bearing on most vulnerable groups. *Asian Pacific Journal of Tropical Medicine, 3*(4), 294

297

Karunamoorthi, K., Deboch, B., & Tafere Y. (2013). Knowledge and practice concerning malaria, insecticide-treated net (ITN) utilization and antimalarial treatment among pregnant women attending specialist antenatal clinics. *Journal of Public Health,3*(18), 559-566

Kegan, R., & Lahey, L. L. (2014). Immunity to change: *How to overcome it and unlock potential in yourself and your organization*. Boston, MA: Harvard Business Press

Kelly, C. W. (2014). Commitment to health theory: A graphic model. *Workplace Health & Safety, 62*(2), 51. doi:10.3928/21650799-20140121-05

Knoblauch, A. M., Hodges, M. H., Bah, M. S., Kamara, H. I., Kargbo, A., Paye, J., Winkler, M. S.(2014). Changing patterns of health in communities impacted by a bioenergy project in northern Sierra Leone. *International Journal of Environmental Research and Public Health, 11*(12),12997-13016

Lancaster, G. A., Dodd, S., & Williamson, P. R. (2014). Design and analysis of pilot studies: Recommendations for good practice. *Journal of Evaluation in Clinical Practice, 10*(2), 307-312. doi: 10.1111/j.2002.384.doc.x

Lim, S., Yasuoka, J., Poudel, K., Ly, P., & Jimba, M. (2012). Promoting community knowledge and action for malaria control in rural Cambodia: Potential contributions of village malaria workers. *BMC Research Notes 5*:405. doi:10.1186/1756-0500-5-405

Loll, D. K., Berthe, S., Faye, S.L., Wone, L., Arnold, B., Koenker, H…Weber, R. (2014). "You need to take care of it like you take care of your soul": Perceptions

and behaviors related to mosquito net damage, care, and repair in Senegal. *Malaria Journal, 13,* 322. doi:10.1186/1475-2875-13-322

Lundy, T. (2010). A paradigm to guide health promotion into the 21st century: The integral idea whose time has come. *Global Health Promotion, 17*(3), 44–5

Mabaso, M. L. H., & Ndlovu, N. C. (2012). Critical review of research literature on climate-driven malaria epidemics in sub-Saharan Africa. *Public Health, 126*(11), 909-919

Mack, N., Woodsong, C., Macqueen, K. M., Guest, G., & Namey, E. (2015). Qualitative research methods: A data collector's field guide. Family health international, North Carolina, USA. *The Qualitative Report, 21*(12), 2230

Magadi, M., Zulu, E., & Brockerhoff, M. (2003). The inequality of maternal health care in urban sub-Saharan Africa in the 1990s. *Population Studies*, *57*(3), 347-366

Maslove, D. M., Mnyusiwalla, A., Mills, E. J., McGowan, J., Attaran, A., & Wilson, K. (2015). Barriers to the effective treatment and prevention of malaria in Africa: A systematic review of qualitative studies. *BMC International Health and Human Rights* (9) 26 doi:10.1186/1472-698X-9-26

Matthew C.R., Dellicour, S., Roman, E., Mangiaterra, V., Coleman, J., Menendez.,C….Hill, J. (2015). Global call to action: Maximize the public health impact of intermittent preventive treatment of malaria in pregnancy in sub-Saharan Africa. *Malaria Journal, 14*(1), 207 doi.10.1186/s12936-015-0728-x

Matthew, C. R., Philippe, M., Cono, A., David, M., Carine, R., & Daniel, C. (2012). Prevalence of malaria and sexually transmitted and reproductive tract infections in

pregnancy in sub Saharan Africa: A systematic review**.** *Journal of the American Medical Association, 307*(19), 2079-2086 doi. 00005407-201205160-00030.

Metta, E., Haisma, A., Kessy, F., Hutter, I. & Bailey, A. (2014). We have become doctors for ourselves: Motives for malaria self-care among adults in southeastern Tanzania. *Malaria Journal*, *6*(13), 249 https://doi.org/10.1186/1475-2875-13-249

Minkler, M. (2012). *Community organizing and community building for health and welfare* (3rd ed.). New Brunswick, NJ: Rutgers University Press

Mitiku, I., & Assefa, A. (2017). Caregivers' perception of malaria and treatment-seeking behaviour for under five children in Mandura District, West Ethiopia: A cross-sectional study. *Malaria Journal, 16*:144 https://doi.org/10.1186/s12936-017-1798-8

Motamedi, Y. T., Eastman, R.T., Guha, R. and Bender, A. (2018). A systematic and prospectively validated approach for identifying synergistic drug combinations against malaria. *Malaria Journal,* 17:160

Mueller, M. S., Runyambo, N., Wagner, I., Borrmann, S, Dietz, K., Heide, L. (2014). Effectiveness of artemisinin-based combination therapy used in the context of home management of malaria: A report from three study sites in sub Saharan Africa. *Malaria Journal, 7*(1), 190-190. doi:10.1186/1475-2875-7-190

Muty, U., & Arora, N. (2007). Prioritization of malaria endemic zones in Arunachal Pradesh: A novel application of self-organizing maps (SOM). *Internet Journal of Tropical Medicine, 3*(3), 3-3

Mwanje, L. & Comm, B. (2013). Knowledge, attitudes and practices on malaria

prevention and control in Uganda. *Tropical Medicine and International Health,8* (8), 685-698.

Nankabirwa, J., Brooker, S. J., Clarke, S. E., Fernando, D., Gitonga, C. W., Schellenberg, D., & Greenwood, B. (2014). Malaria in school-age children in Africa: An increasingly important challenge. *Tropical Medicine & International Health, 19*(11), 12941309. doi:10.1111/tmi.12374

Nguta, J.M., Mbaria, J.M., Gakuya, D.W. Gathumbi, P.K., & Kiama, S.G. (2015). Antimalarial herbal remedies of Msambweni, Kenya. *Journal of Ethno pharmacology, 128* (2), 424- 232.

Nicolas, P., Thomas B., Céline Toty, Jean, B., Cyrille, T., Alain. D., Grégory, L., Francis, S., Olivier, B., & Didier F. (2007). Effects of local anthropogenic changes on potential malaria vector anopheles hyrcanus and west nile virus vector culex modestus, Camargue, France. *Emerging Infectious Disease Journal, 13*(12).

Nilsson, S. K., Childs, L. M., Buckee, C., & Marti, M. (2015). Targeting human transmission biology for malaria elimination. *PLoS Pathogens, 11*(6), e1004871. doi: 10.1371/journal.ppat.1004871

Nsimba, S., & Kayombo, E. (2008). Sociocultural barriers and malaria health care in Tanzania. *Evaluation & the Health Professions, 31*(3), 318. doi:1524283031

NVivo(10). (2012). Qualitative data software. Retrieve from http://www.qsrinternational.com/

Nyarko, S. H., & Cobblah, A. (2014). Sociodemographic determinants of malaria among under five children in Ghana. *Malaria Research and Treatment, 6*(17) 67

doi:10.1155/2014/30436

Oyekale, A.S. (2015) Assessment of Malawian mothers' malaria knowledge, healthcare preferences and timeliness of seeking fever treatments for children under five. *International Journal of Environmental Research and Public Health, 12* (1)

Patton, M. Q. (2015). Qualitative research & evaluation methods (4th Ed.). Thousand Oaks, CA: Sage

Potvin, L., Gendron, S., Bilodeau, A., & Chabot, P. (2005). Integrating social theory into public health practice. *American Journal of Public Heallth*, *95*: 591–595.

Prahl, M., Jagannathan, P., McIntyre, T. I., Auma, A., Farrington, L., Wamala, S., . . . Feeney, M. E. (2016). Timing of in utero malaria exposure influences fetal CD4 T cell regulatory versus effector differentiation. *Malaria Journal, 15*(1), 1-10. doi:10.1186/s12936-016-1545-6

Quenneh, T. N. (2016). *Insecticide treated nets as an effective malaria control strategy in Liberia* from Dissertations & Theses @ Walden University. (Order No. 10002503).

Randall, M. (2014). Malaria-associated health-seeking behaviour among the Jola of the Gambia, West Africa. *Journal of the Indiana Academy of Social Sciences 12*: 86–96.

Reeves, S., & Hodges, B. D. (2008). Qualitative research methodologies. Retrieved from http://www.bmj.com/content/337/bmj.a1020

Ricci, F. (2013). Social implications of malaria and their relationships with poverty. *Mediterranean Journal of Hematology and Infectious Diseases, 4*(1), e2013048.

doi:10.4084/MJHID.2012.048

Rogerson, S. J. (2017). Management of malaria in pregnancy. *Indian Journal of Medical Research, 146* (3), 328-333 doi 10.4103/ijmr.IJMR_1304_17

Romay-Barja, M., Cano, J., Ncogo, P., Nseng, G., Santana-Morales, M. A., Valladares, B., . . . Benito, A. (2016). Determinants of delay in malaria care-seeking behaviour for children 15 years and under in Bata district, Equatorial Guinea. *Malaria Journal, 15*(1), 187. doi:10.1186/s12936-016-1239-0

Russell, M. (2014). The economic burden of illness for households in developing countries: A review of studies focusing on malaria, tuberculosis, and human immunodeficiency virus/acquired immunodeficiency syndrome. *American Journal of Tropical Medical Hygiene, 71* (2), 147-155.

Sachs, J., & Malaney, P. (2012). The economic and social burden of malaria. *Nature, 415*(6872), 680-685. doi:10.1038/415680a

Semakula, H., Song, G., Achuu, S. P., & Zhang, S. (2016). A Bayesian belief network modelling of household factors influencing the risk of malaria: A study of parasitaemia in children under five years of age in sub-Saharan Africa." *Environmental Modelling & Software,75*, 59–67

Sewe, M.O., Ahlm, C., & Rocklöv, J. (2016). Remotely sensed environmental conditions and malaria mortality in three malaria endemic regions in western Kenya. *PLoSONE, 11*(4), e0154204. doi:10.1371

Shah, J. A., Emina, J. B. O., Eckert, E., & Ye, Y. (2015). Prompt access to effective malaria treatment among children under five in sub-Saharan Africa: A multi-

country analysis of national household survey data. *Malaria Journal, 14*(1), 329. doi:10.1186/s12936-015-0844-7

Silal, S., Penn-Kekana, L., Harris, B., Birch, S., & McIntyre, D. (2012). Exploring inequalities in access to and use of maternal health services in South Africa. *BMC Health Services Research*, *12,*120. doi: 10.1186/1472-6963-12-1201

Singh, R., Musa, J., Singh, S., & Ebere, U. (2014). Knowledge, attitude and practices on malaria among the rural communities in Aliero, northern Nigeria**.** *Journal of Family Medicine and Primary Care, 3*(1), 39–44. doi:10.4103/2249-4863.130271

Somi, M.F., Butler, J.R., &Vahid, F. (2015). Is there evidence for dual causation between malaria and socioeconomic status? Findings from rural Tanzania. *American Journal of Tropical Medicine and Hygiene, 77*, 1020–1027

Sonko, S. T., Jaiteh, M., Jafali, J., Jarju, L. B., D'Alessandro, U., Camara, A., … Saho, A. (2014). Does socio-economic status explain the differentials in malaria parasite prevalence? Evidence from The Gambia. *Malaria Journal, 13*, 449. doi:10.1186/1475-2875-13-449

Soriano, F. I. (2013). Conducting needs assessment: A multidisciplinary approach (2nd Ed.). Thousand Oaks, CA: Sage

Statistics Sierra Leone (SSL). 2006b. Sierra Leone population and housing census 2004*,* Final Report. Freetown, Sierra Leone: Statistics Sierra Leone.

Statistics Sierra Leone (SSL) and National HIV/AIDS Secretariat (NHS). 2005. *National Sero Prevalance Survey 2005.* Freetown, Sierra Leone: Statistics Sierra Leone and National HIV/AIDS Secretariat.

Stratton, L., O'Neill, M. S., Kruk, M.E., & Bell, M.L. (2013). The persistent problem of malaria: Addressing the fundamental causes of a global killer . *Social Science & Medicine, 67* (5), 854-862 https://doi.org/10.1016/j.socscimed.2013.05.013

Teklehaimanot, A., & Mejia, P. (2012). Malaria and poverty. Annals of the New York Academy of Sciences, 113632-37. doi:10.1196/annals.1425.037

Thiam, S., Kimotho, V., & Gatonga, P. (2013). Why are IPTp coverage targets so elusive in sub Saharan Africa? A systematic review of health system barriers. *Malaria Journal*, *12*(1), 353. doi: 10.1186/1475-2875-12-353

Tuck, J., & Williams, J. (2016). Malaria protection in Sierra Leone during the Ebola outbreak 2014/15; the UK military experience with malaria chemoprophylaxis sep 14-feb 15. *Travel Medicine and Infectious Disease, 14*(5), 471-474.doi: http://dx.doi.org/10.1016/j.tmaid.2016.07.005

Turner, D. W. (2010). Qualitative interview design*:* A practical guide for novice investigators. *The Qualitative Report, 15*(3) 754-760. Retrieved from: http://www.nova.edu/ssss/QR/QR15-3/qid.pdf

Tusting, L.S. (2016). Why is malaria associated with poverty? Findings from a cohort study in rural Uganda. *Journal of Infectious diseases of poverty, 5*(1), 78-142 doi: 10.1186/ 249-016-0164-3

Uneke, C.J. (2008). Diagnosis of plasmodium falciparum malaria in pregnancy in sub-Saharan Africa: The challenges and public health implications *Parasitology research, 102*(3), 333-342 doi:10.1007/s00436-007-0782-6

United Nations Development Program. (2009). Human development report 2009 Retrieve

from: http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf.

Uskul, A. K., Sherman, D., & Fitzgibbon, J. (2009). The cultural congruency effect: Culture, regulatory focus, and the effectiveness of gain- vs. loss-framed health messages. *Journal of Experimental Social Psychology, 45*, 535-541.

Van Eijk, A., Hill, J., Noor, A., Snow, R., & O ter Kuile, F. (2015). Prevalence of malaria infection in pregnant women compared with children for tracking malaria transmission in sub Saharan Africa: A systematic review and meta-analysis. *Lancet Global Health. 3*(10):e617-e628 doi. 10.1016/S2214-109X(15)00049-2

VanScoy, A. & Evenstad, S.B. (2015). Interpretative phenomenological analysis for LIS research. *Journal of Documentation, 71*(2), 338-357, https://doi.org/10.1108/JD-09-2013-0118

Williams, P. C., M., Martina, A., Cumming, R. G., & Hall, J. (2009). Malaria prevention in sub-Saharan Africa: A field study in rural Uganda. *Journal of Community Health, 34*(4), 28894

Wirth, J. P., Rohner, F., Woodruff, B. A., Chiwile, F., Yankson, H., Koroma, A. S., . . . Hodges, M. H. (2016). Anemia, micronutrient deficiencies, and malaria in children and women in Sierra Leone prior to the Ebola outbreak - findings of a cross-sectional study. *PloS One, 11*(5), e0155031. doi:10.1371/journal.pone.0155031

World Health Organization. (2002). *WHO Traditional Medicine Strategy 2002–2005.* (Geneva, Switzerland: World Health Organization).

World Health Organization. (2013). The world malaria report 2013. Rome, World Health

Organization. Retrieve from: http://www.who.int/malaria/publications/world-malaria-report-2016/report/en/

World Health Organization. (2016). Global malaria program. Retrieved from: http://www.who.int/malaria/publications/atoz/malaria-terminology/en/

Worral, E., Basu, S., & Hanson, K. (2012). The relationship between socioeconomic status and malaria: A review of the literature. *London School of Hygiene and Tropical Medicine,* 1-46

Yujin, K. (2016). The pilot study in qualitative inquiry. *Journal Qualitative Social Work, 10* (2), 190-206. doi: 10.1177/1473325010362001

Zhang, L., Feng, J., & Xia, Z. (2014). Malaria situation in the People's Republic of China in 2013. Zhongguo Ji Sheng Chong Xue Yu Ji Sheng Chong Bing Za Zhi = *Chinese Journal of Parasitology & Parasitic Diseases, 32*(6), 407.

Appendix A: Interview Questionnaire

1. Are you between the ages of 21 - 35, 35 - 45, 45 – 55 or 55 – 65?
2. Are you married, divorced, widowed or single?
3. Do you have children? If yes, how many?
4. What is your level of education? Elementary school, secondary school or college?
5. What kind of work do you do?
6. Have you ever had to take care of someone with malaria?
7. Please tell me about your experience taking care of that person.
8. What do you believe causes malaria?
9. What are some of the signs and symptoms of malaria?
10. How do you think malaria is contracted?
11. What do you believe can be done to prevent malaria?
12. Why do you think people suffer from malaria?
13. Do you think that malaria is a severe problem? If so why?
14. What makes you think you should seek treatment for malaria?
15. What are your beliefs about the use of mosquito nets?
16. Where do people get treatments for malaria?
17. From your opinion what are some of the malaria treatments that you believe are beneficial ?
18. What are your beliefs about malaria treatments from traditional healers?
19. What do you or people you know think about malaria treatments from hospitals?

20. Do you or people you know have any traditional beliefs about malaria? If so, what are they?
21. Do you have any religious beliefs about malaria? If yes, what are they?
22. Do you or people you know have cultural beliefs that influence malaria treatment? If yes, what are they?
23. Do you or people you know have easy access to malaria treatment?
24. How costly is it to treat malaria? Do you think people can afford to pay for malaria treatment?
25. What are some of the reasons people are unable to obtain malaria treatment?
26. What are the challenges you may encounter in seeking malaria treatment?
27. Is malaria common among children? If so how are the children treated for malaria and does it affect their schooling?
28. Why do you think people would choose traditional healers or Western medicines for malaria?
29. How effective are traditional healers in treating malaria?
30. Do you know of any pregnant woman that has suffered from malaria?
31. What do pregnant women do to prevent or treat malaria?
32. Is there anything else you would like to share about your experience or beliefs about malaria?

Appendix B: Interview Protocol

Date: _____

Interviewer: _____ Interviewee: _____

1. Introduce myself to the participants and thank them for volunteering.
2. Inform the participant of the purpose of the research and the information to be collected during the interview.
3. Discuss the contents of the Informed Consent Form and obtain participant's signature.
4. Review the interview process with the participants by reminding them of the interview duration, the need for privacy, and uninterrupted time.
5. Inform the participants that the interview will be recorded, notes taken, and I will use the audio recording and notes to accurately transcribe their responses.
6. Inform the participants that their participation in the interview is voluntary, and they have the right to stop the interview at any time with no penalty.
7. Inform the participants that all information obtained in the interview will remain confidential and their identity will remain anonymous.
8. Provide participants a copy of their signed consent.
9. Provide the interview participants with a telephone number for future contact.
10. At the end of the interview session, provide a gift to the participant and thank them for their participation.