Pediatric Malaria:Determinants of delay in seeking treatment for malaria in children under five years

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Abstract:
Malaria is a common illness but at the same time preventable illness that possess a challenge to healthcare structures in different parts of the world. The disease is caused by a parasite that infects the anopheles mosquito. According to the Centers for Disease Control and Prevention (CDC) report, malaria causes at least 229 million clinical episodes and 409,000 deaths (CDC, 2021). Further, the most vulnerable population in terms of morbidity and mortality rates comprise children who are below the age of 5 (WHO, 2018). According to the World Health Organization (2018), more than 285,000 children died before their fifth-year birthdays. Furthermore, UNICEF (2020) indicates that there were 228 million reported cases of malaria infection in 2018. The prevalence of malaria is high in most areas of Sub-Saharan Africa. Climatic conditions in most of these regions support the lives of *Anopheles gambiae* which is the mosquito that is responsible for high rates of transmission. Datoo et al. (2021) indicate that the increasing danger of the aforementioned disease has attracted interest for developing a vaccine by the year 2030. Kenya is one of the countries that has been significantly affected by the prevalence of malaria. The disease is not only affecting individuals but also exerting a considerable economic burden on the country. Efforts of public and private parties in controlling the prevalence of the disease are commendable. However, these efforts are affected by delays when it comes to seeking treatment. This study seeks to explore the determinants of delay in seeking treatment for malaria in children who are under five years old. The study takes a qualitative approach and examines recent scholarly literature sources. The researcher believes that insights from the study will be necessary for nursing practice especially in fostering holistic and optimal care.

Keywords:	Malaria OR Pediatric Malaria OR Malaria Care AND children OR Pediatric Malaria Care OR delay determinants in pediatric malaria care and treatment
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FOREWORD

I am grateful for all those who supported me throughout the process of writing the thesis. Most importantly, I would like to thank Heikki Paakkonen and Terese Sjolund for their guidance and supervision throughout the process of coming up with the thesis. Their opulence in knowledge and vast experience in handling research-based questions not only stands out but is also commendable. Furthermore, I wish to applaud the immense and unrelenting support that I received from my thesis group mates and my family the discussions that we had were mind-blowing. Further, they were insightful and challenging.

1 INTRODUCTION

Malaria is considered one of the common illnesses that continues to pose a challenge to healthcare systems in Africa (Sypniewska et al., 2017). The disease which is characterized by symptoms such as fever, chills, sweating, and fatigue is caused by a parasite that infects the anopheles mosquito. These mosquitos transmit the infection to humans through bites. In such a scenario, humans are infected by four types of malaria parasites that consist of Plasmodium falciparum, P. ovale, P. vivax, and P. malariae. According to the World Health Organization (WHO), children under the age of 5 years represent one of the most vulnerable groups. In Africa, at least 285,000 children died before their fifth-year birthdays (WHO, 2018). On the other hand, UNICEF (2020) argues that there were 228 million reported cases of malaria in 2018. These cases led to 405,00 deaths. Out of the aforementioned cases, 67% (272,000) were children below 5 years. This statistic translates to a daily toll of almost 750 cases of pediatric malaria. Furthermore, it indicates that every two minutes a child under five years dies of pediatric malaria (Malaria in Africa - UNICEF DATA, 2020). Most of these deaths occur in Sub-Saharan Africa.

In high transmission areas, children are usually exposed to partial immunity in their early childhood years. However, nonimmune children are not only exposed to the risks of infection but also exhibit symptoms such as a high fever that might be accompanied by headache and chills (Getahun et al. 2010). In other cases, children may develop respiratory distress that might progress to cerebral malaria. For such situations, cerebral malaria manifests as seizure and altered sensorium. In Kenya, pediatric malaria is considered an urgent public health priority issue (Getahun et al. 2010). As such, its control, as well as the cost of treatment, tends to trap many families in a cycle of suffering, illness, and to larger extent poverty.

According to Akech et al. (2020), the disease is predominantly experienced among young children specifically those belonging to a pediatric age group. Even though there has been an unprecedented decline in the intensity of malaria transmission in Africa since 2000, increasing cases of pediatric malaria pinpoint the need for practical preventive approaches that would help scale up vector control while at the same time improve case management (Duffy et al., 2019). Furthermore, the scope of coverage in terms of

existing prevalence rates and interventions highlights the need for more sophisticated interventions that would accelerate future declines in malaria transmission as well as the disease burden. The major determinants of delay in seeking treatment for Malaria have consist of the distance to healthcare facilities, complaints on the side effects of antimalarial drugs, and the cost of transportation to the respective care facilities. Even with the identification of the aforementioned determinants, the major causes of delayed treatment have not yet been identified (Duffy et al., 2019). Selection and suitability of the research topic is based on the increasing morbidity and mortality rates among children due to preventable cases of malaria. Efforts from the government to control the issue is commendable. However, there is the need for consistent and extensive research on more improved approach towards controlling the situation especially when it comes to addressing the determinants of delay in seeking treatment.

2 BACKGROUND

Malaria is a major public health concern. According to the CDC (Centers for Disease Control and Prevention) report, the disease caused at least 229 million clinical episodes and 409,000 deaths. Further, the CDC 2021 report not only recognizes malaria as a leading cause of death in most of the developing countries but also indicates that at least 94 percent of deaths in 2019 occurred in the WHO (World Health Organization) region (CDC, 2021). Malaria occurs in most of the poor as well as subtropical areas of the world with Africa being the most affected continent due to a set of factors. First and foremost, the region supports the lives of *Anopheles gambiae* which is the mosquito that is responsible for high rates of transmission. Further, local weather conditions create an ambiance that is characterized by increased transmission of *Plasmodium falciparum* throughout the year (CDC, 2021). Most of the countries in Africa are still developing. In this regard, they have scarce resources while at the same time experience socio-economic instability. This situation hinders effective malarial control initiatives. In other parts of the world, malaria is less prominent. However, it leads to substantial disease as well as incapacitation especially in countries such as South Asia and South America (CDC, 2021).

The Centers for Disease Control and Prevention further indicates that the most vulnerable persons comprise of the ones with no or little immunity against Malaria. This statement is also supported by Johansson (2016) who argues that in areas of high transmission such as most of the African countries young children tend to have partial immunity to malaria. Furthermore, pregnant women have decreased immunity due to the pregnancy. In this regard, they are also vulnerable especially during the first as well as second pregnancies (CDC, 2021). Hogan et al. (2018) also note that travelers or in some cases immigrants who come from areas that have low or no rates of transmission and lack immunity are also vulnerable. The high burden as well as the wide geographical distribution of Malaria caught the attention of the World Health Organization (WHO) who saw the need for developing malaria vaccine that comes with a protective efficacy of nearly 75% against clinical malaria by the year 2030 (Datoo et al., 2021). Consequently, there are myriad efforts directed towards developing the vaccine as well as addressing the public health goal.

Most importantly, Malaria is associated with social and economic implications. According to Jackson et al. (2020), it imposes substantial costs to individuals as well as governments. Individuals usually incur costs when purchasing treatment drugs at home, traveling to health care facilities, and the cost of health care services at the respective facilities. Jackson et al. (2020) acknowledges the highlighted costs and indicates that some of the individuals my lost some days of work or even be absent from school. Rosa et al. (2020) also associate malaria with additional expenses for preventive measures or even burial in cases where the disease led to death. The government also incurs costs for supplying, maintaining, and staffing health care facilities. Furthermore, the government through respective ministries is expected to promote public health interventions against malaria such as the distribution of insecticide-treated bed nets and insecticide spraying.

According to the CDC, Kenya has an estimated 3.5 million cases with 10,700 deaths occurring annually. Individuals living in the western part of Kenya are the most vulnerable. This observation is also supported by the World Health Organization (WHO). Furthermore, WHO indicates that children under the age of 5 years are the most vulnerable. In support of this position, WHO indicates that in 2016 nearly 285,000 children lost their lives to Malaria before their fifth birthdays. Consequently, the World Health Organization recommends that children especially those from high transmission areas should be subjected to partial immunity during childhood. Besides the aforementioned recommendation, WHO advocates for preventive measures such as the use of long-lasting insecticidal nets, seasonal malaria chemoprevention (SMC) especially in areas with higher transmission rates, and prompt diagnosis. These recommendations are also supported by Jackson et al. (2020) who apart from insisting on the use of long-lasting insecticidal nets argues that respective health care facilities, especially in the most affected areas, should collaborate in the effective treatment of malaria infections.

Malaria is one of the health risks in Kenya that is associated with unprecedented morbidity and mortality especially among children who are under 5 years of age (Jackson et al., 2020). According to Johansson (2016), plasmodium falciparum is the most common cause of malaria. In treating and managing pediatric malaria cases, prompt as well as effective treatment approaches function as the cornerstone for case management (Hogan et al., 2018). The Centers for Disease Control and Prevention identifies the health risks associated with malaria especially for people who leave in the Western part of Kenya.

In this regard, CDC collaborates with the Kenya Medical Research Institute (KEMRI) which forms part of Kenya's Ministry of Health. Through the collaboration CDC has managed to offer capacity building as well as technical support, assist in monitoring and evaluation of malaria cases, prevention, case management, transmission reduction research, and laboratory.

Capacity building and technical support encompass the provision of technical assistance as well as funding for malaria research. As for monitoring and evaluation of malaria cases, KEMRI and CDC collaboratively conduct facility surveillance by documenting infections identified in hospitals and other health care facilities. According to CDC (2018) prevention is achieved through vaccines, vector control, and controlling the spread of malaria in pregnancy. Case management is achieved by using standard treatments such as the Artemisinin Combination Therapies (ACTs) which are commonly used in different African countries. Apart from the highlighted initiatives, Johansson (2016) indicates that CDC collaborates in measuring malaria transmission and supporting epidemiological studies as well as research.

While the CDC in collaboration with KEMRI can be able to coordinate and adopt myriad solutions to modern-day health problems, the prevalence of malaria especially for children who are under the age of 5 years should not be left out. As Sypniewska et al. (2017), indicates, the available health care and research institutions should contribute to the fight against pediatric malaria in ways that honor the healthcare's heritage while at the same time celebrates shared humanity with patients and the affected communities. This position is also supported by Akech et al. (2020) who also indicates that a higher population of children under five years fail to receive the required medical attention.

Based on the studies that were conducted by Akech et al. (2020) in different parts of Kenya, it is evident that the effectiveness of treatment and control of Malaria is affected by complaints on the side effects of antimalarial drugs, the cost of traveling to healthcare facilities, and distance from health care facilities. These issues function as the major determinants of delay when it comes to seeking treatment for malaria. Getahun et al. (2010) also concur with Johansson's (2016) decision by indicating that most of the malaria-related complications especially among the aforementioned group were due to existing delays in seeking treatment. Notably, there are no previous studies that explore

major causes of delayed treatment seeking among healthcare providers especially those who focus on delivering care to children who are under five years (Johansson, 2016).

In Kenya, the treatment policy of malaria assumes different treatment approaches with the common one being diagnosis-based treatment. As such, the diagnosis of malaria not only among children but also adults are determined by clinical suspicion as well as the detection of parasites in the blood (Sypniewska et al., 2017). In this type of treatment, it is recommended that an individual confirms the diagnosis of malaria regardless of the age-group of the patient. Confirmatory diagnosis utilizes approaches such as microscopy or RDTs (rapid diagnostic tests). Akech et al. (2020) indicate that the interventions in Kenya have been integrated in such a way that they encompass the provision of prompt and desired treatment of pediatric malaria. However, Akech et al. (2020) pinpoint the need for more improved approaches towards case management. This position is also supported by Johansson (2016) who highlights the need for additional vector control approaches using long-lasting insecticidal bed nets among other integrated vector management strategies.

3 THEORETICAL FRAMEWORK

The study is guided by Jean Watson Theory. The theory was developed in 1988 in a bid to assist nurses to meet the healing needs of patients in a holistic manner (Watson, & Woodward, 2020). The theory encompasses ten curative factors that nurses are expected to use to achieve desired patient outcomes. The suitability of the theory with regard to the research topic is based on the position that it offers easy-to-follow while at the same time a comprehensive view of expected levels of holistic care and patient-centeredness (Savieto, & Leão, 2016). This makes it possible to not only identify the major determinants of delay in treatment but also identify ways of achieving desired patient outcomes among pediatric malaria patients. The Jean Watson Theory views human beings as a whole (Rosa et al., 2020). In this regard, it considers the psychological, biological, and social components that need to be balanced in a way that would promote health and overall wellbeing.

The Jean Watson Theory seeks to guide healthcare professionals especially pediatricians in providing holistic care that will meet the healing as well as well-being needs of pediatric malaria patients together with their respective families comprehensively. Furthermore, the theory instills a predefined doctrine that is pegged with the belief that nursing care represents a sacred science that incorporates artistic as well as scientific principles (Watson, & Woodward, 2020). In as much as professionals and established conventions would depict nursing care as an area that was derived from scientific principles such as the pharmacological and non-pharmacological approaches, it is also based on the art of care. The art of care entails altruistic human interaction. Extrapolating from this position, the aforementioned theory will help nurses as well as other healthcare professionals in meeting the healing as well as the well-being of pediatric malaria patients in a manner that takes care of the three critical healing dimensions (the mind, body, and soul).

Besides taking care of the highlighted dimensions, the Jean Watson Theory is pegged with the concept of transpersonal caring that has a significant impact in the modern-day care provision especially in settings that necessitate disease prevention, management, and overall healthcare promotion. As such, the transpersonal caring concept vies nursing care as the existence of an interpersonal relationship between the nurse and patient

(Watson, & Woodward, 2020). Through such a connection sound therapeutic relationship evolves. In this perspective, the success of administered nursing interventions to not only malaria patients who are below five years old but also other patients outside the age bracket is tethered on the quality of the existing connection or relationship between the nurse and the patient.

3.1 Key concept of the Jean Watson Theory

Watson's Theory is based on four main concepts. These concepts consist of the person (patient), environment, nursing, and health (roles, goals, and functions). Extrapolating from the confines of the theory, the patient (person)is valued, taken care of, understood, and nurtured. As such, the value of a person is greater than that of his or her body parts. On the other hand, the concept of health from Watson's perspective is an addition to the theory that was already developed by the World Health Organization (WHO) (Wei, & Watson, 2019). According to the theory, health is depicted as the full functioning of social, physical, and mental aspects of a person. The absence of any health-related disorder as well as general adaptation to daily functioning are also considered as part of the definition of health. The concept of environment is tagged along with caring. Most importantly, the environment changes depending on the existing generation to adapt to the changing times (Watson, & Woodward, 2020). Lastly, the concept of nursing focuses on promoting while at the same time improving the general wellness of patients. The concept of nursing aims at understanding human science based on ethical human transactions.

The Jean Watson Theory depicts the existence of a sheer agreement between the abovementioned concepts. Each of the concepts is inter-related and pivoted on the nursing process. Notably, the patient (person) exhibits functional integrity by constantly interacting with the environment. This interaction determines the quality of life that a person enjoys (Rosa et al., 2020). In a situation whereby the interaction is of low quality and fails to support an individual's well-being, illness occurs. In such a situation, the nurse plays the role of conducting patient-centered assessment based on the identified

needs and brings on board the missing ‘curative factors.’ Such a strategy promotes and restores health and overall well-being (Savieto, & Leão, 2016).

The Jean Watson Theory tends to propose as well as several assumptions regarding healthcare. The first assumption is based on the position that quality health care can be attained through interpersonal communication. A major characteristic of result-oriented interpersonal communication. Interpersonal communications promote interaction in a manner that upholds effective communication (Savieto, & Leão, 2016). For instance, listening to patient's issues gives nurses the opportunity to effectively attend to patient's needs thus promote good health. The theory also promotes the assumption that quality caring involves personal as well as family needs. Furthermore, the theory treats the holistic growth of an individual as a more important factor than just the persons' physical wellbeing (Rosa et al., 2020). The third assumption is derived from the fact that the science of caring compliments the one of curing. In this regard, when one fails to take care of his or her body appropriately, healthcare professionals will handle the issue by introducing a curing intervention.

4 AIM AND RESEARCH QUESTIONS

The ultimate goal of this research is to explore practical and effective ways of reducing morbidity while at the same time prevent mortality due to pediatric malaria. Essentially, the study seeks to identifying the primary causes of delay in treatment-seeking. This move will help control prevalence rates, identify practical evidence-based interventions that nurses could utilize in managing malaria, and support the currently implemented mitigation strategies. The study seeks to examine strategic interventions such as the ones that promote early parasitological diagnosis as well as prompt response to cases of pediatric malaria.

Research Questions.

How can nurses address the challenges of delay in treatment of Malaria in children under 5 years?

5 METHODOLOGY

This research study focuses on collecting empirical data and information on the above-mentioned topic. The data and information will be analyzed and synthesized in a way that would promote the construction of an evidence-based position for answering the research question. A literature review pegged on qualitative research design attempts to gather data as well as information from different scholarly articles and other related but approved sources. The available literature on the research topic will be critiqued, synthesized, and summarized. Highlights on new research areas will also be explored and gaps, as well as deficiencies on the topic, will be discussed (Hogan et al., 2018). An inductive methodological approach will be used in this qualitative literature review. The data collection process will be exhaustive, pivotal, and representative. Most importantly, the selected articles are subjected to exclusion and inclusion criteria to help identify the best literature sources while at the same time help in the collection of crucial data and information. Notably, an inductive methodological approach is utilized in the qualitative narrative review (Azungah, 2018).

5.1 Data collection

Literature review functions as an efficient and effective approach when utilizing the qualitative research design. One of the most significant aspects of this approach is its ability to make it possible to collect data and information regarding a research topic from a broader perspective. The literature review serves the purpose of critically appraising and synthesizing existing as well as concurrent knowledge on the research topic. Extrapolating from this perspective new approaches can be adopted and utilized in resolving existing problems while at the same time guide future research based on the existing and additional knowledge gaps that will be identified during the study process. In this regard, this research study can be conducted based on different stages that consist of identifying and defining the scope of the review, accessing, and collecting the relevant sources, filtering relevant information, comprehensively reading through the filtered literature, and constructing the review (Levine et al., 2018).

According to Paré and Kitsiou (2017), the process of exploring literature sources during the data collection process can be categorized into exhaustive, representative, and pivot-

al processes. The exhaustive process or strategy is utilized when the process aims to come up with a comprehensive review whose conclusions are pegged on an all-inclusive knowledge base. Notably, this strategy is utilized in systematic reviews. Its suitability in a systematic review is based on the convention that it provides an extensive summary of the current literature (Dooly et al., 2017). As for the representative strategy, it is based on the selection of few scientific materials that will act as a representative of the other works based on the field of study and the research topic. The pivotal strategy is utilized when the main focus of the review is on sources that have been pivotal to a specific research question according to an innovative method or concept.

Extrapolating from the aim of the study, the representative approach was utilized in carrying out the data collection process. The representative approach gave provisions for abstracting the collected information to a larger number of scholar-based sources. According to Levine et al. (2018), such an approach ensures that all the relevant pieces of data and information are included in the review and the right mix of information has been identified. Notably, infective execution of the strategy might lead to bias. As such, certain information or study variables might be over-represented while at the same time opinions regarding the study might be magnified while others may be under-represented. Most importantly, the representative strategy carries the characteristics that are crucial for the study (Levine et al., 2018). In this regard, the approach can support the certainty of the study while at the same time assist in reducing the possible instance of bias.

Several online academic databases were examined to collect data and information utilized in the literature review. The process was based on inclusion and exclusion criteria whereby the inclusion criteria comprised of all the relevant sources based on their title, abstract information, and the data of publication. The date of publication was not later than 2015. The relevant articles had either two or more keywords. The term ‘pediatric malaria’, ‘malaria’, ‘determinants of delay in treatment of malaria’, and ‘delay in treatment of malaria’ were included in the search based on their relevance to the research topic as well as the research question. An advanced search was also utilized during the process of identifying qualifying articles and the strategy employed Boolean search phrase. The search was limited to peer-reviewed and systematic re-viewed articles. All the other articles that failed to meet the aforementioned qualifications were excluded from the study. The inclusion and exclusion criteria led to the selection of 9 articles that

were relevant to the research study. The process of data collection, as well as selection, is illustrated below.

Table one: An illustration of the exclusion and inclusion process of research

Inclusion Criteria	**Exclusion Criteria**
Peer-review articles from 2015 to 2021	Peer-review articles from 2014 backwards.
English Language	Focus on epidemiological study of malaria among adults
Focus on malaria among children who are less than 5 years old	Uses other languages apart from English
Focuses on the determinants of delay in treatment of malaria	Non-peer reviewed articles and websites
Qualitative and quantitative literature sources	Do not contain one or more keywords such as pediatric malaria', 'malaria', 'determinants of delay in treatment of malaria', and 'delay in treatment of malaria'
Contains keywords such as pediatric malaria', 'malaria', 'determinants of delay in treatment of malaria', and 'delay in treatment of malaria'	

Table one: An illustration of the exclusion and inclusion process of research

It is important to note that the initial electronic search utilized 4 major databases (Google Scholar, PubMed, Science Direct, and EBSCO). The utilized filters comprised of English language, and the date was from 2015 to presents with the scholarly (peer-reviewed) journals being the most preferred ones. Furthermore, the selected documents were online articles mostly the academic peer-reviewed journals that had a full text limit.

Table Two: Graphical illustration of search terms and search results on data/ information collection and selection process.

Number	Boolean Search Keywords	Google Scholar	PubMed	Science Direct	EBSCO
1	Malaria OR Pediatric Malaria OR Malaria Care AND children OR Pediatric Malaria Care OR delay determinants in pediatric malaria care and treatment	100	65	50	75
Criteria	Completion of the inclusion and exclusion criteria	15	10	6	8
Final selection	Final selection process based on the inclusion and exclusion criteria as well as the relevance of the articles to the research question	6	1	1	1

List of the Selected Articles

From the inclusion as well as the exclusion criteria, the following articles were selected based on their relevance to the research question.

1. Akech, S., Chepkirui, M., Ogero, M., Agweyu, A., Irimu, G., English, M. and Snow, R.W., 2020. The Clinical Profile of Severe Pediatric Malaria in an Area Targeted for Routine RTS, S/AS01 Malaria Vaccination in Western Kenya. *Clinical Infectious Diseases*, *71*(2), pp.372-380.

2. Duffy, F., Bernabeu, M., Babar, P.H., Kessler, A., Wang, C.W., Vaz, M., Chery, L., Mandala, W.L., Rogerson, S.J., Taylor, T.E. and Seydel, K.B., 2019. Meta-analysis of Plasmodium falciparum var signatures contributing to severe malaria in African children and Indian adults. *MBio*, *10*(2).
3. Getahun, A., Deribe, K. and Deribew, A., 2010. Determinants of delay in malaria treatment-seeking behaviour for under-five children in south-west Ethiopia: a case control study. *Malaria Journal*, *9*(1), pp.1-6.
4. Hogan, B., Eibach, D., Krumkamp, R., Sarpong, N., Dekker, D., Kreuels, B., Maiga-Ascofaré, O., Gyau Boahen, K., Wiafe Akenten, C., Adu-Sarkodie, Y. and Owusu-Dabo, E., 2018. Malaria coinfections in febrile pediatric inpatients: a hospital-based study from Ghana. *Clinical Infectious Diseases*, *66*(12), pp.1838-1845.
5. Johansson, E.W., 2016. Beyond 'test and treat'–malaria diagnosis for improved pediatric fever management in sub-Saharan Africa. *Global health action*, *9*(1), p.31744.
6. Sypniewska, P., Duda, J.F., Locatelli, I., Althaus, C.R., Althaus, F. and Genton, B., 2017. Clinical and laboratory predictors of death in African children with features of severe malaria: a systematic review and meta-analysis. *BMC medicine*, *15*(1), p.147.
7. Wei, H., & Watson, J. (2019). Healthcare interprofessional team members' perspectives on human caring: A directed content analysis study. International journal of nursing sciences, 6(1), 17-23.
8. Jackson, K.D., Higgins, C.R., Laing, S.K., Mwila, C., Kobayashi, T., Ippolito, M.M., Sylvia, S. and Ozawa, S., 2020. Impact of substandard and falsified antimalarials in Zambia: application of the SAFARI model. BMC public health, 20(1), pp.1-11.
9. Shumerga, A. T., Hebo, H. J., Gebrehiwot, T. T., & Gebre, M. N. (2020). Determinants of Delay in Seeking Malaria Treatment for Under-Five Children at Gambella Town, Southwest Ethiopia: A Case-Control Study. *Journal of Tropical Medicine*, *2020*.

5.2 Data/content Analysis

The study adopted a data/ content analysis strategy to examine the highlighted nine articles. Notably, this strategy was utilized as a base of categorization with regard to Granheim and Lundman's (2004) qualitative approach. According to Erlingsson and Brysiewicz (2017), the aforementioned analysis approach follows two principles which can be broadly categorized into qualitative and quantitative approaches. Based on the selected literature sources regarding the identification and study of the determinants of delay in malaria treatment among children who are below five years can be described as 'fragmented'. The highlighted analysis employed an inductive approach that was also text-driven since it is associated with a search for patterns (Erlingsson, & Brysiewicz, 2017). Extrapolating from this position, similarities, as well as discrepancies in the selected data, were identified and the analysis process moved from concrete as well as specific information to abstractions and theories.

Based on the requirements of the study, a qualitative approach was employed. In this regard, the process involved the classification, verification, and evaluation of qualitative data. Extrapolating from the author's point of view, the unit of analysis comprised of words or phrases in a text that was to be reviewed even before data analysis. The meaning units consisted of sentences, words, and paragraphs that relate to each other in the form of content as well as context. Notably, the codes acted as labels of the meaning unit. From the authors' explanation, using a code to label a meaning unit derived a new while at the same time different approach when it comes to thinking about data. Most importantly, the process of understanding the code should relate to the context. The aforementioned codes are then joined to form categories. These categories have a descriptive meaning based on the fact that they answer the question 'what'. Categories can be divided further into sub-categories with the theme functioning as an underlying meaning on an interpretation level that consists of condensed meaning units, categories, or in some situation's codes.

5.2.1 Reading and coding

The researcher examined each article repeatedly while at the same time made notes in the margins on the relevant insights especially the ones that connected to the research question. Through this process, the meaning units were not only marked but also labeled using codes. Notably, the codes were derived from specific research topic-based keywords. The codes were later categorized based on their relevance to the research question. The inductive content analysis approach is deemed appropriate for this case whereby the phenomenon is fragmented based on the available literature. It is important to note that the categorization of the aforementioned codes was pegged on similarities in data and concrete information that is specific to theories and abstractions. Based on this approach, the codes gave provisions for data to be examined in a new light while at the same time assist in creating abstractions. The coding process not only used frequency of words or phrases since this could have led to the risk of missing the context but also content categories, and themes. In this regard, the researcher considered also the context of data (Stuckey, 2015).

The above-mentioned codes were identified using a word frequency tool linked to qualitative data analysis software NVivo. Ideally, the software came up with 25 potential codes that relate to the aforementioned research question. Out of the 25 codes, only 19 codes were selected. The process of narrowing down to 19 codes was inspired by the need to avoid ambiguity risks. Out of the 19 codes, 9 categories emerged. These categories were attached to their commonalities. Based on the underlying connections between categories, the classification approach was divided into 3 major themes: economic factors, sociodemographic factors, and behavioral-based factors. The outcome of the content analysis process based on the codes, themes, and categories is listed in the table below.

Table three: Illustration of the codes, category, and themes from the content analysis process

Codes	Category	Themes
Family monthly income	Economic gain	Economic factors
Career/ profession		
Employment/ unemployment		
Skills and knowledge	Salary/ Allowances	
Level of Education	Economic loss	Sociodemographic factors
Both/single parent		
Climatic conditions of an area		
Societal inequalities		
Shortages of health care facilities	Quality of healthcare	
Quality of delivered care		
Nurse and doctor's workplace environment	Provision of patient-centered care	
Ethnic practices and beliefs		
Public awareness	Education/ awareness systems	
Quality of caregiver education		
Increased cost of care		
Malaria mitigation strategies	Codes of practice	Behavioral based factors
Safe environmental practices		
Inadequate observance of preventive measures	Inadequate Implementation of preventive strategies	
	Community Sensitization	
National and regional initiatives		

5.3 Research ethics

According to Dooly et al. (2017), research ethics is imperative to the study process. In this regard, researchers should always avoid research misconduct such as falsification, plagiarism, and fabrication. In this study, the researcher adhered to the outlined princi-

ples regarding research ethics while at the same time avoided the highlighted forms of research misconduct when reviewing the selected literature sources. The data collection process was based on secondary sources that were not only scientific but also scholarly. In this regard, the researcher followed an ethical approach by ensuring that the utilized sources were properly cited and referenced. Additionally, the texts from selected sources were paraphrased to ensure that the study is not plagiarized. The process of analyzing data encompassed stringent measures which ensured that there was no misinterpretation and omission of crucial information through the application of personal opinion besides the literature findings (Dooly et al., 2017). The researcher also ensured that the copyright rules were upheld especially when it came to accessing and extracting research data and information.

The less structured nature of qualitative research makes it harder to anticipate required ethical considerations. It is for this reason that Roth and von Unger (2018) pinpoint three issues pertinent to qualitative research. These issues consist of the researcher/ participant relationship, researcher's subjective definition of data, and the research design. The process of reviewing literature in this study adopts two latter types. These types were pegged on examining the ethics of all articles that were selected for review. The research process followed stipulated guidelines by the Finnish Advisory Board on Research Integrity (TENK, 2021). Adhering to original research guidelines was not only necessary but also important for this study. In this regard, issues relating to plagiarism either intended or non-intended were examined. Furthermore, the study utilized correctly referencing as well as citing. Also, the research adhered to strict ethical and legal guidelines. As for plagiarism and referencing when presenting other researchers' work was important to the research process.

It is important to note that the quality of selected data and information, as well as the results, are preserved in such a way that no additions, misinterpretation of even misleading accounts of research outcomes, or methodology was committed during the process of analyzing the results. Further, presented data was not fabricated in any way and a high standard of referencing was utilized.

6 FINDINGS

This chapter presents the findings of the study based on the analyzed literature sources. The findings are categorized into four major themes that also serve as subcategories for addressing the aforementioned research question. It is important to note that these subcategories could be derived from the manifest content or the latent content of each of the selected literature sources. The research attempted to address the abovementioned research question on "How can nurses address the challenges of delay in treatment of Malaria in children under 5 years?" The research question will be handled based on data and insights from the suitable findings and results. In this regard, the highlighted themes are constructed in a way that they can critically be accepted as answers to the research question. The essence of this chapter is to come up with the basement for major discussions through which the main goal of the research study will be reached. Notably, the findings are divided into sociodemographic, economic, and behavior-based factors. These factors are described and illustrated below.

Determinants of Delay in Treatment of Malaria Among Children who are Below 5 Years.

6.1 Sociodemographic Factors

One of the identified determinants of delay in treatment of Malaria among children who are below the age of 5 years was sociodemographic factors. In brief, sociodemographic factors comprise a set of variables such as age, sex, education, ethnicity, religious affiliation, employment, marital status, income, and migration background (Johansson, 2016). It is important to note that a set of index variables can be extrapolated from the socio-demographic variables. Some of these index variables consist of socio-economic status which is a combination of education and income. In the study on the determinants of delay in treatment of malaria among children who are below 5 years, socio-demographic factors appeared to be influencing knowledge, prevention practices, and attitude regarding malaria. By seeking a clear understanding of the social as well as behavioral factors that determined the delay in treatment of malaria, it was evident that most of the aforementioned variables played an imperative role.

The study by Shumerga et al. (2020) indicated that factors such as family's monthly income, religious and ethnic affiliations, and level of literacy or education determined the delay in treatment of malaria in the highlighted population. Based on a multivariable logistic regression approach that was specifically fitted to identify independent factors that are linked to the delay in seeking treatment as well as to control for cofounders. Bivariate analysis by Hogan et al. (2018), also indicated that the delay in seeking treatment for malaria was significantly higher in the rural areas with the estimated percentage of delay being at 58.1%. further, the delay in treatment outside the home was also higher among individuals who lived at least three kilometers from the nearest health care facility. The level of literacy or education also played a major role in determining delay in treatment. With the most affected regions being rural areas, education was imperative in determining the causes of malaria as well as the implementation of preventive measures. The study by Shumerga et al. (2020) indicated that 52.9% of caregivers failed to recognize the fact that malaria is transmitted by a mosquito. This led to a delay in seeking treatment.

Education was imperative in determining the duration of delay in treatment as well as articulating causative and malaria prevention factors. For instance, Johansson (2016) indicates that there were variations in terms of detecting and understanding the causes of malaria and the best approach to take regarding treatment. Whereas malaria is caused by mosquitoes' bites there was a group of individuals who believed that individuals contracted the disease due to lack of cleanliness. Further, other groups associated the disease with traditional and unjustifiable factors. The confusion arising from the causes and effective treatment of malaria justifies the selection of education as one of the socioeconomic determinants of delay in treatment of malaria. It also unravels the impact of education on other related factors such as career, employment, and income levels. For instance, families with more educated families are quick to detect malaria symptoms as soon as they show up and take the necessary action. On the other hand, families with less-educated parents tend to speculate. In this regard, they delay seeking a professional or recommended form of malaria treatment.

The level of education also determines the career levels of a parent or parents. Parents who have higher levels of education earn more than their counterparts. Furthermore, they are employed in better organizations or companies. In this regard, they are in a better position of enjoying additional remuneration packages such as comprehensive health

covers. In such, families whenever a child or children falls ill not only in the case of malaria but also other types of illnesses, he or she is taken to the hospital as soon as possible. This is usually not the case for less-educated parents. To a larger extent, education stands out as a parameter that determines income levels, access to health care, the type and quality of health care, and promptness in terms of responding to the symptoms of malaria as well as other types of illnesses.

Besides the aforementioned factors, religion also played an imperative role when it comes to determining delays in treatment (Hogan et al., 2018). Most parents or caregivers appeared to address the issue of treatment based on their respective religions. For instance, some believed in traditional healing whereas others associated illnesses such as malaria with wrongdoing and unsubstantiated factors such as curses (Duffy et al., 2019). Based on the fact that areas with high prevalence rates are comprised of rural areas where individuals are confined to traditional approaches of healing, most parents would delay seeking modern treatment. The age of parents also contributed socially to the delay in treatment. For instance, a study by Shumerga et al. (2020), revealed that older parents with no history of child mortality in their families were likely to delay in seeking malaria treatment for their under-five children. As such, a parent or caregiver who had no history of child mortality in his or her family four times more likely to delay in seeking malaria treatment when compared to the ones who had a history of child mortality (Shumerga et al., 2020).

6.2 Economic Factors

To a larger extent, malaria inflicts major costs on different households in Kenya and the overall economy of other malaria-endemic countries. According to Aketch et al. (2020), evidence suggests that the economic burden of the disease is higher among the poorest individuals or families in a population. Further, there is a difference in cost burden based on the disease endemicity. This position is also supported by Jackson et al. (2020) who also pinpoints the need to account for epidemiological as well as geographical differences when estimating the social and economic burden of malaria. Jackson et al. (2020) also indicate that such data is limited. It is for this reason that they encourage further research especially the one that seeks to establish the economic burden of malaria in Kenya. The cost burden of malaria functions as a product of a complex relationship

between epidemiological, social, and economic factors. It is important to note that the economic burden of malaria and delay in treatment will also vary considerably due to the varying endemicity. According to Hogan et al. (2018), malaria endemicity can be defined as the amount of the disease covering a particular region. Extrapolating from this position, endemicity tends to determine the most vulnerable groups of the population that are at a higher risk of malaria morbidity (Aketch et al., 2020).

The relationship between malaria endemicity and the delay in treatment especially in children who are below the age of 5 years can be seen from transmission differences whereby individuals from populations that are at lower risk may delay seeking treatment as compared to those who are from high-risk areas. It is important to note that financial and overall economic situation plays a major role in determining the kind of care that parents of the infected child are going to opt for. According to Hogan et al. (2018), individuals perceive malaria differently based on the level of risk as well as exposure to the clinical disease. These perceptions tend to influence decisions on seeking treatment. For example, parents of children who live in areas of unstable malaria transmission may perceive the disease as deadly. In this regard, they will immediately or quickly seek treatment. On the other hand, those living in stable transmission areas with improved economic conditions might opt for other approaches such as self-treatment or even delay treatment due to the perception that the symptoms are less severe.

Sociodemographic factors are closely linked to economic factors. As such, economic factors such as the family's monthly income tends to determine their financial and overall economic situation (Shumerga et al., 2020). Higher prevalence, morbidity, and mortality rates due to malaria that is associated with delay in treatment were recorded in the poorest households (62.9%) (Shumerga et al., 2020). Patterns extracted from this data indicated that there was a consistent and significant trend that could be summarized as the lower the wealth level, the longer the delay. On the other hand, higher wealth levels translated to shorter delays in treatment. Notably, low socio-economic status played a critical role in influencing the aforementioned delay. As such, rich households that also operate in improved or the best economic situations were 2.7 times more likely to seek early treatment than those from the poorest households. Parents or caregivers from the poorest households opted for other variables when it comes to seeking treatment for Malaria.

The existing economic situation in the most affected or malaria-prone areas translates to low social support especially from close family members or even the community thus leading to a delay in seeking treatment. Based on Akech et al.'s (2020) findings, malaria patients or even parents of children exhibiting malaria symptoms who happened to receive medium or even high level of social support sort treatment rapidly following the beginning of symptoms. Social support from the family is not only a determinant of delay in treatment but also a factor that might help in the process of understanding possible complications as well as the severity of malaria originating from self-treatment (Akech et al., 2020).

Social support may also serve to increase the belief that malaria is not a routine illness but one with a high risk of developing severe symptoms. It is for this reason that results from Hogan et al.'s (2018) study tend to suggest that most of the determinants of delay in treatment should be addressed through the personal intervention of friends and family rather than the commonly utilized mass media approach about malaria. Further, the cost of visiting health care facilities as well as the educational level of parents should always be recognized as statistically significant factors when it comes to addressing the issue of malaria treatment among children.

The distance to respective care facilities was also a prime factor when it comes to determining delay in treatment. As such, children who lived at least three kilometers away from the nearest health care center or facility were two times more likely to exhibit a delay when it comes to seeking not only malaria but also other forms of care from the respective facilities than those who lived closer to the centers (Hogan et al., 2018). The concept of distance was also supported by Jackson et al.'s (2020) study who apart from recognizing it as a determinant of delay they indicated that patients in most of the affected areas delayed seeking treatment due to the available means of travel. As such, some areas had better roads, cars, and motorcycles whereas other areas faced limitations in terms of availability of the aforementioned means of transport. Further, access to health care facilities in other areas was affected by the area's topography and the nature of the roads. For instance, some areas in the western part of Kenya are hilly, remote, and lack all-weather or tarmacked roads (Akech et al., 2020). This makes it difficult to access treatment services during unfavorable weather conditions.

Johansson (2016) appears to link the delay in malaria treatment with poverty levels. As such, the disease has a higher prevalence in areas where individuals are poor than in wealthier neighborhoods. As Johansson (2016) indicates, the burden of malaria is greater among the world's poorest regions. Even though studies examining malaria incidence by economic status specifically on a smaller scale have failed to provide enough data that acts as a consistent picture when investigating the poor population groups, it is clear that economic situations influence the delay in treatment. It is important to note that households incur both direct and indirect costs as a result of malaria. Direct costs can be in form of treatment costs. This type of cost is influenced by the type of treatment that a family seeks, the duration of illness, and the severity of the disease. Notably, the cost of care in private facilities tends to be more expensive when compared to similar treatment in public health facilities. Additionally, indirect costs resulting from the inability to conduct livelihood activities due to illnesses can also be higher especially in areas that experience unstable transmission. For instance, the economic burden can be lower in areas where the prevalence rates of malaria are higher among children than adults. In such settings, the delay in treatment may be minimal since parents are still able to work and cater for treatment costs for their children. Furthermore, in such settings, most parents have access to medical cover which can cater to quality health care services.

The prevalence of malaria comes with a significant economic burden which to a larger extent is crucial especially when it comes to defining priorities while at the same time targeting interventions efficiently and equitably. According to the Division of Malaria Control (DOMC), Kenya has five categories of malaria ecology. They consist of the lake-side endemic, the coastal endemic, highland epidemic-prone districts, the arid epidemic prone-districts, and the low-risk districts. The lake-side endemic areas comprise regions that are close to Lake Victoria with high malaria transmission throughout the year. The coastal endemic is represented by areas that experience almost similar characteristics in terms of prevalence like the one of the lake-side endemics. The main difference between the two categories is based on the risk of infection and transmission. As such, the two factors tend to be strong based on climatic conditions (Hogan et al., 2018). The highland epidemic-prone districts exhibit limited transmission. However, the malaria transmission rate is still high in these areas due to rainfall and temperature variations.

As for the arid epidemic-prone areas, communities that live close to water sources are the most vulnerable with the transmission rate being low. Most importantly, residents in

these areas do not develop immunity. Lastly, the low-risk regions have a limited to low risk of malaria infection. These variations are tagged with economic characteristics whereby the economy of such regions especially the ones that are prone to high prevalence rates. As such, most of the areas with high prevalence rates experience infrastructural limitations such as the availability of well-equipped hospitals. Consequently, individuals from these areas delay when seeking treatment not only for children but also adults.

6.3 Behavioral Based Factors

Behavior also played a major role in determining the delay in treatment. According to Shumerga et al.'s (2020) study, 64 percent of the study participants had opted to treat themselves or their children by taking an antipyretic that is available at home or even purchasing drugs over the counter before seeking professional treatment at the health facilities. Ethnicity was also a key issue which apart from a demographic factor it contributed to behaviors that led to the delay in seeking treatment (Sypniewska et al., 2017). It is undeniable that most children under the age of 5 years are unable to make decisions regarding their health. In this regard, their parents make such decisions which at this juncture the decisions are influenced by myriad factors with ethnicity being one of them. As such, Kenyans especially those living in the rural areas are strongly affiliated with their ethnic backgrounds. In this regard, most of their behaviors on different life practices including health care are confined to ethnic beliefs and practices (Sypniewska et al., 2017). Extrapolating from this position, the rate of patient delay when it comes to seeking treatment especially among children under the age of five years may vary significantly due to the ethnic-related behaviors by the parents. It is important to note that ethnic behaviors and beliefs tend to link malaria and other common diseases to supernatural causes that resulted from past or even current misdeeds. This situation acts as a barrier to the understanding of modern western ideology and related health care practices thus leading to a delay in treatment.

From the aforementioned perspective, ethnic-based behaviors also determined the type of care that parents would prefer for their children immediately they begin exhibiting malaria-related symptoms. According to Akech et al.'s (2020) research, 1.5 % of the respondents had visited a traditional healer when their children or any member of the

family felt ill. Furthermore, the majority of other individuals who had suffered previous malaria illnesses or their children had been in a similar predicament had initially opted for self-treatment. In such a situation, the involved children or individuals will delay seeking professional treatment services with the hope that their approach will be effective in managing and treating the illness (Akech et al., 2020). Notably, infection with *P.vivax* also contributed to behaviors that led to delay in seeking treatment for malaria. According to Johansson (2016), *P.vivax* malaria infections are associated with less severe symptoms when compared to *P.falciparum* and other mixed infections. In this regard, whenever children suffer from such malaria infections, parents would opt for self/ home treatment that is mainly administered by taking 'left-over' drugs either at home or from a nearby shop. In most instances, the selected drug is usually meant to act on some of the symptoms of malaria such as relieving fever or headache. As reported by Jackson et al. (2020) and Johansson (2016), patients or parents of children exhibiting malaria-related symptoms may wait until the signs and symptoms become more serious before embarking on the decision to visit a health facility. Some studies such as the one for Jackson et al. (2020), indicate that behavior leads to self-treatment which occurs in situations whereby the initial symptoms are mild or during the period of illness. However, the situation can progress to a scenario that is characterized by the development of severe symptoms.

6.4 Summary of the findings

The findings present a comprehensive view on the delay determinants when it comes to malaria treatment especially for children who are under the age of 5 years. Even though the explored literature covered myriad issues regarding the prevalence, epidemiology, and treatment of malaria, the most important issues are the sociodemographic, economic, and behavioral-based factors. To a larger, these factors either as a single factor or when combined with the other tend to determine the delay in seeking treatment not only for children but also adults. In brief sociodemographic factors encompass age, gender, ethnicity, education, religious affiliation, employment, migration background, marital status, and income. These determined the delay in seeking treatment in different ways. For instance, parents who are educated can quickly detect malaria symptoms and seek professional treatment. A higher level of education is also associated with better careers

that come with better income as well as additional packages such as premium medical cover thus making it easier to immediately seek quality treatment.

On the other hand, lower levels of education may translate to low incomes due to low-paying jobs or even unemployment. In such situations, parents might opt for cheaper alternatives to treatment such as home-based medication or even traditional medication. The aforementioned issue is interconnected in such a way that one issue or sub-factor influences the other. As for economic factors, they tend to relate with the sociodemographic factors. The most notable thing about economic factors is that they determine not only the delay duration in terms of accessing treatment but also the type of treatment. As such, parents can only cater to healthcare services that they can afford. This observation tends to justify Shumerga et al. (2020) which indicates that a high prevalence rate of malaria, morbidity, and mortality due to delay in treatment are common in areas with poor economic conditions. On the other side, areas with wealthy populations have easier access to quality and premium health services and thus leading to shorter delays in seeking treatment. It is important to note that malaria inflicts direct and indirect costs to families mostly in terms of medical expenses. Further, the prevalence of malaria, as well as the delay in seeking treatment, adds up to Kenya's economic burden. Lastly, behavior-based factors that contribute to the delay in seeking treatment consist of self-diagnosis and treatment practices, cultural practices, and parental care. In developing countries such as Kenya, families are used to self-diagnosis and treatment, especially in rural areas. As such, diseases are identified and treated based on the similarity of the symptoms that they exhibit. In such circumstances, parents might delay seeking treatment with the hope that their diagnosis, as well as a treatment procedure, will work. Notably, there are some variants of malaria that depict less severe symptoms than others. For instance, *P.vivax* malaria infections have less severe symptoms when compared to *P.falciparum* (Johansson, 2016). This variation in symptoms might contribute to the delay in seeking treatment.

7 DISCUSSION

Malaria is an issue of concern in Kenya and other developing nations based on the economic burden that the disease exerts on the country (Hogan et al., 2018). It is impact socially and economically especially when it comes to mortality and morbidity rates that has attracted the attention of global organizations such as the World Health Organization (WHO) that is currently development of a vaccine (Datoo et al., 2021). Furthermore, infected families incur directly as well as indirect costs. Even though the country might be having adequate resources in terms of the required medication and even health care facilities that offer quality services, the issue of delay in seeking treatment poses a challenge not only to the government's initiative of controlling morbidity and mortality rates but also to nurses especially when it comes to delivering quality care that would foster desired patient outcomes. Conventionally, nursing practice is pegged on principles as well as the ideology of promoting a holistic approach to quality care that will lead to better patient outcomes. In this regard, conducting a study on the determinants of delay in seeking treatment for malaria in children who are below five years serves as one of the practical mechanisms of identifying possible loopholes and strategically addressing them.

In analyzing the study findings, the researcher explored different determinants of delay when it comes to treatment for malaria among children who are below 5 years. The findings encompass far-reaching insights and information on the determinants of delay in seeking treatment for children not only for malaria but many other related infections. The main determinants consisted of the distance to health care facilities, cost of travel to the facilities, and complaints on the side effects of antimalarial drugs. From the reviewed literature sources, people living in areas where there is a long distance between residences and the health care facilities tend to delay more as compared to their counterparts. On the other hand, the cost of travel also delayed the process of seeking treatment for malaria among children. Based on other underlying factors such as the family's social and economic status, poor families appeared to delay more than wealthier families due to the cost of travel. Lastly, the delay in seeking treatment was also influenced by complaints on the side effects of antimalarial drugs. Studies such as the one of Aketch et al. (2020) and Hogan et al. (2018) pointed out myriad misconceptions that individuals confine themselves to without seeking professional advice or clarification.

Consequently, they tend to delay treatment based on such misleading or unverified information.

The aforementioned determinants work hand in hand with sociodemographic, economic, and behavior-based factors. Examining the findings through Jackson et al.'s (2020) point of view reveals a lot regarding factors such as income, economy, religion, and behaviors of parents when it comes to seeking treatment not only for malaria but also other illnesses. Jackson et al. (2020) also give information that significantly supports the inclusion of Jean Watson's theoretical framework in the study topic. The researcher established that the aforementioned theory is not only practical but also applicable to the study topic. As such, the theory assists in identifying the impact of the aforementioned determinants and also guiding nurses towards identifying treatment needs of the affected populations holistically. Extrapolating from the theory, the pediatric malaria patient should be viewed as a whole. In this regard, the psychological, social, and biological components should be included in the evaluation of the effects of the delay in treatment and in the development of strategies steps geared towards effecting holistic care regardless of setting. Achieving a balance between the components will serve as the best way for identifying major challenges that motivate the highlighted delay.

To a larger extent, the use of Jean Watson Theory as the study's theoretical framework significantly contributed to shaping the focus of the study. From a healthcare professional point of view, the four components of the theory (person, environment, nursing, and health) were key in identifying different factors affecting the time taken to seek treatment (Savieto, & Leão, 2016). The findings pointed out the need to treat the patient as someone greater. In this regard, different factors within the patient's environment such as the cost of care, location of health care facilities, and patients' beliefs as well as practices should be considered when identifying the best way of achieving optimal care. It is important to note that health encompasses full functioning of the mental, social, and physical aspects. Achieving a balance in all the states necessitates identifying the patient as well as the direct and indirect needs in the patients surrounding (Savieto, & Leão, 2016). For instance, in addressing the issue of possible beliefs regarding antimalarial drugs, nurses can promote patient awareness especially within populations that have limited information on malaria prevention and treatment. Furthermore, in regions whereby health care facilities are located far away from the patient. Alternative options such as telemedicine could be utilized.

Extrapolating from the abovementioned theory, the concept of patients' environment is based on care. In this regard, nurses should identify practical ways of effecting the desired type of care while at the same time improving the wellness of patients. As Rosa et al. (2020), pinpoints the interaction of different factors contained in the Jean Watson Theory determines the quality of life that an individual enjoys. In this regard, nurses especially in populations that are mostly affected by the delay in seeking treatment should use existing evidence in identifying practical ways of promoting quality interactions of the aforementioned factors in a way that will support the wellbeing of children whenever illnesses such as malaria occur (Watson, & Woodward, 2020).

In several review articles, authors called upon improving the cost of care especially in rural areas whereby individuals delay seeking due to the involved costs. The creation of an affordable insurance coverage plan at a national level was evident. Furthermore, the need for community awareness and education was also a factor that should also be considered. Community education and awareness were depicted as the most practical way by which nurses can build trust in people or caregivers who might be having different opinions regarding antimalarial drugs (Watson, & Woodward, 2020). Further, it can help in creating a balance between teaching and learning with the intention of addressing individual or patient needs (Shumerga et al., 2020).

In response to Shumerga et al.'s (2020) position on creating a balance between teaching and learning Jackson et al. (2020) argue that addressing the challenge posed by delay in treatment needs collaborative engagement from all stakeholders including the government. As such the government should at the front line in promoting equitable allocation of resources. For instance, rural areas such as the ones in the western parts of Kenya should have better infrastructure in terms of roads and health care facilities. Reflecting on Aketch et al.'s (2020) arguments, pediatric and severe malaria hospitalizations especially in western Kenya continue to affect the younger age groups. Subsequent studies especially those that entailed a long-term follow-up on the aforementioned determinants indicate that case fatality rates for pediatric malaria remain high, despite the implementation of improved malaria management guidelines in different health facilities.

Preventing pediatric malaria progression as well as improving timely access to health care facilities are not only a priority in Kenya but all the other developing countries in the world. Malaria presentations continue to evolve in terms of complexity. In this regard, improvements especially in supportive and primary care that encompasses ad-

dressing the above-mentioned determinants of delay will help in preventing future malaria-related complications in children as well as adults.

8 CONCLUSION

The study findings were derived from the research question “How can nurses address the challenges of delay in treatment of Malaria in children under 5 years?” Ideally, malaria was seen as a disease that poses a threat to children especially those who are under five years while at the same time posing a challenge to the nursing practice and in the general health care industry. The most critical factor that influences morbidity and mortality rates with regard to malaria infections is the delay in seeking treatment. High malaria prevalence rates are common in most of the developing counties in Africa. Kenya represents one of these countries that has been adversely affected by major determinants such as the distance to health care facilities, cost of travel to the facilities, and complaints on the side effects of antimalarial drugs. It is important to note that the control and management of malaria in children who are under five years depending on the study of major causes of delay in seeking treatment. Based on the examined literature sources the main factors that relate to the aforementioned determinants comprise sociodemographic factors, economic factors, and behavior-based factors. It is important to note that for children who are under five years, the decision to seek treatment is pegged on their parents or caregivers.

By fulfilling the abovementioned research question, the researcher believes that the nursing fraternity will not only benefit from the newly created knowledge but also incorporate the insights and information into practice. To a larger extent, the presented knowledge functions as a solid foundation for identifying the determinants of delay in malaria treatment as well as establishing strategic steps at a personal, community, and national level geared towards preventing and controlling malaria. Most of the outlined concepts are not only applicable to Kenya but also to many other developing countries that might be facing similar challenges. Nonetheless, through the study health care facilities and other related government and non-governmental institutions will have a practical and effective backup for correcting mistakes in the currently applied strategies and even promote more advanced approaches for addressing the determinants of delay in seeking treatment for children.

8.1 Strengths and Limitations of the Study

The main strength of the study can be derived from the relevance of the research topic especially in Kenya and other developing countries that experience high morbidity and mortality rates among children who are below the age of five years. The study explores major determinants of delay while at the same time delivers evidence-based insights from approved literature sources that can be used in justifying the relevance of the aforementioned determinants. Even though the small number of reviewed literature sources (nine) might be a limitation, the narrowness of the study topic led to limitations on the available specific knowledge and thus leading to comprehensives of the reviewed materials. Further, the selection and utilization of an inductive methodological approach assisted in ensuring that the content analysis process was not only objective but also exhaustive. Nonetheless, all literature sources were not only recent but also scholar based. It is important to note that most of the utilized literature sources were from the latest studies. In this regard, the researcher was able to identify and use the latest scholarly sources.

As for the limitations, the study was majorly confined to the determinants of delay among children who are five years and younger. However, these determinants could also affect other children who are more than five years. Extrapolating from this perspective, the study suggests that additional evidence-based research should be undertaken in Kenya and other developing countries all over the world. The study was conducted as a literature review. In this regard, there was the aspect of generalization during the search process using the keyword “Determinants of delay in treatment of malaria for children”. In this search, the age bracket of children who are below the age of 5 years was not taken into consideration. Therefore, sources obtained using the aforementioned keywords failed to cover all the keywords contained in the research topic.

KÄLLOR / REFERENCES

Akech, S., Chepkirui, M., Ogero, M., Agweyu, A., Irimu, G., English, M. and Snow, R.W., 2020. The Clinical Profile of Severe Pediatric Malaria in an Area Targeted for Routine RTS, S/AS01 Malaria Vaccination in Western Kenya. *Clinical Infectious Diseases*, *71*(2), pp.372-380.

Azungah, T. (2018). Qualitative research: deductive and inductive approaches to data analysis. *Qualitative Research Journal*.

CDC. (2021, January 26). CDC - Malaria - Malaria worldwide - Impact of malaria. Retrieved from https://www.cdc.gov/malaria/malaria_worldwide/impact.html#

Datoo, M. S., Natama, H. M., Some, A., Traore, O., Rouamba, T., & Bellamy, D. (2021, April 20). High efficacy of a low dose candidate malaria vaccine, R21 in 1 adjuvant matrix-m™, with seasonal administration to children in Burkina Faso. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3830681

Dooly, M., Moore, E., & Vallejo, C. (2017). Research Ethics. *Research-publishing. net*.

Duffy, F., Bernabeu, M., Babar, P.H., Kessler, A., Wang, C.W., Vaz, M., Chery, L., Mandala, W.L., Rogerson, S.J., Taylor, T.E. and Seydel, K.B., 2019. Meta-analysis of Plasmodium falciparum var signatures contributing to severe malaria in African children and Indian adults. *MBio*, *10*(2).

Erlingsson, C., & Brysiewicz, P. (2017). A hands-on guide to doing content analysis. *African Journal of Emergency Medicine*, *7*(3), 93-99.

Getahun, A., Deribe, K. and Deribew, A., 2010. Determinants of delay in malaria treatment-seeking behaviour for under-five children in south-west Ethiopia: a case control study. *Malaria Journal*, *9*(1), pp.1-6.

Hogan, B., Eibach, D., Krumkamp, R., Sarpong, N., Dekker, D., Kreuels, B., Maiga-Ascofaré, O., Gyau Boahen, K., Wiafe Akenten, C., Adu-Sarkodie, Y. and Owusu-Dabo, E., 2018. Malaria coinfections in febrile pediatric inpatients: a hospital-based study from Ghana. *Clinical Infectious Diseases*, *66*(12), pp.1838-1845.

Jackson, K.D., Higgins, C.R., Laing, S.K., Mwila, C., Kobayashi, T., Ippolito, M.M., Sylvia, S. and Ozawa, S., 2020. Impact of substandard and falsified antimalarials

in Zambia: application of the SAFARI model. *BMC public health*, *20*(1), pp.1-11.

Johansson, E.W., 2016. Beyond 'test and treat'–malaria diagnosis for improved pediatric fever management in sub-Saharan Africa. *Global health action*, *9*(1), p.31744.

Levine, S., Pastor, P., Krizhevsky, A., Ibarz, J., & Quillen, D. (2018). Learning hand-eye coordination for robotic grasping with deep learning and large-scale data collection. *The International Journal of Robotics Research*, *37*(4-5), 421-436.

Rosa, W. E., Dossey, B. M., Koithan, M., Kreitzer, M. J., Manjrekar, P., Meleis, A. I., ... & Watson, J. (2020). Nursing theory in the quest for the sustainable development goals. *Nursing science quarterly*, *33*(2), 178-182.

Roth, W. M., & von Unger, H. (2018, September). Current perspectives on research ethics in qualitative research. In *Forum qualitative sozialforschung/forum: Qualitative social research* (Vol. 19, No. 3).

Savieto, R. M., & Leão, E. R. (2016). Nursing assistance and Jean Watson: a reflection on empathy. *Escola Anna Nery*, *20*(1), 198-202.

Shumerga, A. T., Hebo, H. J., Gebrehiwot, T. T., & Gebre, M. N. (2020). Determinants of Delay in Seeking Malaria Treatment for Under-Five Children at Gambella Town, Southwest Ethiopia: A Case-Control Study. *Journal of Tropical Medicine*, *2020*.

Stuckey, H. L. (2015). The second step in data analysis: Coding qualitative research data. *Journal of Social Health and Diabetes*, *3*(01), 007-010.

Sypniewska, P., Duda, J.F., Locatelli, I., Althaus, C.R., Althaus, F. and Genton, B., 2017. Clinical and laboratory predictors of death in African children with features of severe malaria: a systematic review and meta-analysis. *BMC medicine*, *15*(1), p.147.

TENK. (2021). Ethical review. Retrieved from https://tenk.fi/en/ethical-review

UNICEF DATA. 2020. *Malaria In Africa - UNICEF DATA*. [online] Available at: <https://data.unicef.org/topic/child-health/malaria/> [Accessed 21 January 2021].

Watson, J., & Woodward, T. K. (2020). *Jean Watson's theory of human caring*. SAGE Publications Limited.

Wei, H., & Watson, J. (2019). Healthcare interprofessional team members' perspectives on human caring: A directed content analysis study. *International journal of nursing sciences*, *6*(1), 17-23.

World Health Organization. 2018. *Malaria In Children Under Five*. [online] Available at: <https://www.who.int/malaria/areas/high_risk_groups/children/en/> [Accessed 21 January 2021].

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