MOTHERS’ KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING MALARIA IN CHILDREN UNDER FIVE YEARS OLD AT THYOLO DISTRICT HOSPITAL, SOUTHERN MALAWI

by

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submitted in accordance with the requirements for the degree of

MASTER OF PUBLIC HEALTH

at the

UNIVERSITY OF SOUTH AFRICA

Supervisor: Prof ADH Botha

February 2015
To my late mother
DECLARATION

I declare that MOTHERS' KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING MALARIA IN CHILDREN UNDER FIVE YEARS OLD AT THYOLO DISTRICT HOSPITAL, SOUTHERN MALAWI is my own work, that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references, and that this work has not been submitted before for any other degree at any other institution.

HUMPHREY MAKALANI PANCHI
SIGNATURE

15 FEBRUARY 2015
DATE
ABSTRACT

The aim of this study was to describe mothers’ knowledge, attitudes and practices regarding malaria in children under five years old. A descriptive cross-sectional study design was used. A structured questionnaire was administered by face-to-face interviews during data collection. The study population of this research composed of mothers of children under five years old suffering from malaria in Thyolo district.

Economic-demographic characteristics that were significantly associated with mothers’ knowledge were age (p=0.018), formal education (p=0.001), income (p=0.005), and type of a house (p=0.002). Sources of malaria information that were significantly associated with mothers’ knowledge included television (p=0.004), radio (p=0.005), and posters (p=0.00019).

Treatment-seeking behaviour was significantly associated with education (p=0.017). Treatment prior to hospitalisation was significantly associated with mothers’ education (p=0.0001), number of children that passed away (p=0.015), distance to the health facility (p=0.013), lack of money (p=0.019), and time taken at the hospital to get treatment (p=0.016).

Recommendations were made to improve mothers’ malaria knowledge for further research.

KEY CONCEPTS

Malaria; underfive children; knowledge; attitudes; practices; treatment-seeking behaviour.
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• My children: Tumalisye, Tupoche and Njaliwe, for their understanding during my absence

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<td>AS-AQ</td>
<td>Artesate-amodiaquine</td>
</tr>
<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>BC</td>
<td>Before Christ</td>
</tr>
<tr>
<td>CCAP</td>
<td>Church of central Africa presbyterian</td>
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<tr>
<td>CHAM</td>
<td>Christian Health Association of Malawi</td>
</tr>
<tr>
<td>CSPro</td>
<td>Census and survey processing</td>
</tr>
<tr>
<td>ELISA</td>
<td>Enzyme-linked immunosorbent assay</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross domestic product</td>
</tr>
<tr>
<td>GIZ</td>
<td>German international zusammmenasbeit</td>
</tr>
<tr>
<td>Hb</td>
<td>Haemoglobin</td>
</tr>
<tr>
<td>Hct</td>
<td>Haematocrit</td>
</tr>
<tr>
<td>HDI</td>
<td>Human development index</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>HMIS</td>
<td>Human management information system</td>
</tr>
<tr>
<td>IFA</td>
<td>Indirect fluorescent antibody</td>
</tr>
<tr>
<td>IPTp</td>
<td>Intermittent preventive treatment for pregnancy</td>
</tr>
<tr>
<td>IRS</td>
<td>Indoor residual spray</td>
</tr>
<tr>
<td>ITNs</td>
<td>Insecticide treated nets</td>
</tr>
<tr>
<td>LA</td>
<td>Lumefantrine artemether</td>
</tr>
<tr>
<td>LLINs</td>
<td>Long lasting insecticide treated nets</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium development goals</td>
</tr>
<tr>
<td>MK</td>
<td>Malawi kwacha</td>
</tr>
<tr>
<td>MoH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MSF</td>
<td>Medecins Sans Frontieres</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
</tr>
<tr>
<td>NHSRC</td>
<td>National Health Sciences Research Committee</td>
</tr>
<tr>
<td>NSO</td>
<td>National Statistical Office</td>
</tr>
<tr>
<td>OTC</td>
<td>On the counter</td>
</tr>
<tr>
<td>PCR</td>
<td>Polymerase chain reactions</td>
</tr>
<tr>
<td>PSLCE</td>
<td>Primary school leaving certificate of education</td>
</tr>
<tr>
<td>SDA</td>
<td>Seventh Day Adventist</td>
</tr>
<tr>
<td>SP</td>
<td>Sulfadoxine/pyramethamine</td>
</tr>
<tr>
<td>SPSS</td>
<td>Scientific package for social sciences</td>
</tr>
<tr>
<td>RDTs</td>
<td>Rapid diagnostic tests</td>
</tr>
<tr>
<td>TA</td>
<td>Traditional authority</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
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<tr>
<td>UNISA</td>
<td>University of South Africa</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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<tr>
<td>USA</td>
<td>The United States of America</td>
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<tr>
<td>USAID</td>
<td>United States Aid for International Development</td>
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CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Reducing malaria-related mortality in under-five children to achieve the Millennium Development Goal (MDG) number 4 (which calls for reduction of child mortality by two-thirds from 1990 to 2015) remains a major challenge in many developing countries where malaria is endemic. Many countries have failed to register significant progress since 1990 and now have a daunting task to achieve this goal. Malaria still claims many lives in the developing world especially children under the age of five years (Crawley, Chu, Mtove & Nosten 2010:1468; Kazembe, Muula & Simoonga 2009:165; World Health Organization (WHO) 2013:1). Most of the deaths occur in the rural health facilities partly because health facilities are not well equipped to handle severe malaria complications and delayed care. Numerous factors which may be mother, patient or health system related continue to hamper the malaria treatment and control. In Malawi, mothers play a very important role in the management of sick children. In view of this, it is worthwhile to identify mothers’ knowledge, attitudes and practices regarding malaria in under-five children and develop policies and strategies to stem the burden of malaria-related deaths in this age group. This descriptive cross-sectional study describes mothers’ knowledge, attitudes and practices regarding malaria in children under five years old at Thyolo District Hospital, southern Malawi.

1.2 BACKGROUND TO THE RESEARCH PROBLEM

Malaria is caused by five species of parasites of the genus Plasmodium that affect people (P.falciparum, P.vivax, P. Ovale, P.malariae and P. Knowlesi). Malaria due to P. falciparum is the most deadly, and it predominates in Africa, Malawi in particular. P. Vivax is less dangerous but wide spread and the other three species are found much less frequently (WHO 2013:1). Malaria is transmitted to humans by the bite of infected female mosquitoes of the genus Anopheles. Congenital transmission and transmission through infected blood transfusion are also well documented (Crawley et al 2010:1468;
Malaria transmission in Malawi is perennial, though it increases during the rainy season, which runs from November through April (Mathanga, Walker, Wilson, Ali, Taylor & Laufer 2012:213). Higher malaria transmission is recorded along Lake Malawi and the lowland areas of the lower Shire valley.

Malaria is a preventable and treatable disease which is endemic in many countries. However, patient factors such as age, parasitaemia, treatment-seeking behaviour, and health care system factors like late diagnosis, misdiagnosis, inappropriate case management, inadequate health care resources, cost of services, and inadequate patient care continue to militate against the treatment of the disease to reduce health facility fatality rate (Ejov, Aung, Lwin & Sein 1999:310; Gatahun, Deribe, & Deribew 2010:2; Kizito, Kayendeke, Nabirye, Staedke & Chandler 2012:2; Msangeni 2011:256; Rogerson, Wijesinghe & Meshnick 2010:51; Yeka 2012:184).

Late presentation of patients to the health facilities is associated with fatal outcome. This is largely due to modes of approach to malaria treatment known by mothers which include buying drugs from chemist shops, taking traditional medicine, attending prayers, and sometimes taking no action at all. Several factors such as educational level, family income, and occupation are known to increase mothers’ knowledge about malaria and its management (Borah & Sarma 2012:41; Jombo, Araoye & Damen 2011:10; Sato 2012:10, Yadav 2010:235). Mothers who are knowledgeable about the disease are likely to use proper preventive measures and take sick children to a health facility in time. Knowledge, therefore, plays a crucial role in reduction of deaths associated with malaria and anaemia in under-five children (Delibew, Birhanu, Sena, Dejene, Reda, Sudhakar, Alemsegede, Tessema, Zuyunudin, Biadgilign & Deribe 2012:1; Larson, Mathanga, Campbell & Wilson 2012:1-2; Lawford, Zurovac, O’Reilly, Hoibak, Cowley, Munga, Vulule, Juma, Snow & Allan 2011:1).

Despite detailed understanding of the complex epidemiology of the parasite, vector, host interaction, and treatment, malaria continues to be a leading cause of death among under-five children living in impoverished communities across Africa, Malawi in particular (Houeto, D’Hoore, Ouendo, Charlier, & Deccache 2007:2 Roca-Felttrer, Kwizombe, Miguel, Sanjoaquin, Sesay, Faragher, Harrison, Geuker, Kabuluzi, Mathanga, Molyneux, Chagomera, Taylor, & Heyderman 2012:271-75).
It is therefore important that the health care providers understand mothers' knowledge, attitudes and practices regarding malaria in under-five children that may affect a good outcome in malaria treatment in Malawi.

1.3 CONTEXTUALISING THE RESEARCH PROBLEM

1.3.1 Geography

Malawi is a landlocked country in Sub-Saharan Africa which lies south of the equator with a total area of 118,484 square kilometres of which 94,276 (80%) square kilometres is land. The remaining 20% is occupied by Lake Malawi, the third largest lake in Africa with a distance of 475 kilometres long. Its neighbouring countries include the United Republic of Tanzania to the north and north-east; Peoples’ Republic of Mozambique to the east, south and south-west; and Zambia to west and north-west (National Statistical Office (NSO) 2011:1). Rift valley is the spectacular topographic feature which passes through Lake Malawi to the Shire valley in Mozambique. The country is administratively divided into three regions: the Northern with six districts, the Central with nine districts and the Southern with 13 districts. The districts are further divided into traditional authorities (TAs), presided by chiefs who are responsible for villages presided by village headmen. Malawi has a tropical continental climate. Temperature and rainfall depend on the altitude and how far is the area from the lake. The rainy season starts in October or November and runs through to April.

1.3.2 Economy

Malawi is a low income country. Agriculture is the mainstay of the economy for about 36% of the gross domestic product (GDP) of US$902 and more than 70% of exports. It is ranked 153 of 169 countries in Human Development Index (HDI) making it one of the poorest countries in the world. It has low HDI ranking because of low GDP per capita, adult literacy rate, and life expectancy at birth. The economy is highly vulnerable to climate conditions such as drought and market changes. The major exports are tobacco, tea and sugar. Thyolo is one of the tea growing districts in the country with many smallholder tea growers and plantations. Tobacco is currently facing problems
due to unpredictable dry spells and heavy rains. This is a big blow to the already fragile and donor dependent economy (NSO & ICF Macro 2011:1).

1.3.3 Population

The population of Malawi continues to grow from 8.0 million in 1987 to 9,933,771 in 1998 and it was found to be 13,066,220 in 2008 housing and population census. This is an alarming 32% increase making it one of the most densely populated African nations (NSO 2008:2; Wilson, Walker, Mailahowa, Mathanga & Taylor 2012:219). The Southern Region has the highest population (45%), followed by Central Region (42%), and Northern Region (13%). The sex ratio of Malawi (male: female) for all ages is 95:100 and 49% of the population is composed of males, 51% females, 17.2% under-five children, 67% under the age of 25 years, while 4% is age 65 or older. The population density grew from 105 persons per square kilometre in 1998 to 139 persons per square kilometre in 2008. This is one of the highest in Sub-Saharan Africa. The vast majority (86%) reside in rural settings. Fertility and mortality are high. For instance, total fertility rate is 5.7, higher in rural (6.1) than urban (4.0). The estimated child mortality (age 12 months to 4 years) is 50 deaths per 1000 live births, infant mortality is 73 per 1000 live births, while the overall under-five mortality is 127 deaths per 1000 live births (NSO 2011:96; Wilson et al 2012:219).

Thyolo District has a population of 587,455, males (47.7%), females (52.3%), and growth rate of 2.5% (NSO 2008:3). The population density is over 268 persons per square kilometre. About 19% of Thyolo population is comprised of under-5 children. It has an under-five mortality of 123 per 1000 live births, a child mortality of 52 per 1000 live births and infant mortality of 75 per 1000 live births (NSO & UNICEF 2008:35).

The problem has been to close the gap between adult and child mortalities. It is difficult because children are more vulnerable to malaria, which is endemic in the country, than adults. It is a challenge to Malawi public health system to identify the contributing factors to high malaria-associated mortalities in under-five children in the health facilities and develop sound interventions to reverse the trend.
1.3.4 Socio-cultural characteristics of Malawi

Malawians have a rich cultural heritage drawn from African tribes in the country with many languages. There are twelve tribes of which Chewa (34%), Lhomwe (16%), Yao (13%), Ngoni (12.9%) to mention but a few. Chewa language which is widely spoken in the country is the national language while English is the official language. Eighty five point seven percent of Malawians embrace Christianity, 13% are Muslims. The rest are Hindu of Asian origin and atheists. On education, 89% of adult males are literate and 19% of the females are illiterate (NSO & ICF Macro 2011:11). In Thyolo district, about 66% of women and 78% of men are literate (NSO & UNICEF 2008:70).

1.3.5 Health care system in Malawi

The Malawi government remains the largest provider of health care services. Malawians access free health services at all government institutions (Wilson et al 2012:219). Other health care providers are Christian Health Association of Malawi (CHAM), composed of Christian health institutions. There are also private health providers, numerous non-governmental organisations (NGOs), and the traditional healers (herbalists). The national health care delivery system is structured on primary, secondary and tertiary levels.

1.3.5.1 Primary health care

Primary health care is the first level of care where people receive basic preventive, curative, and rehabilitative services close to their villages (Joubert 2007:307). There are more than 397 health centres, health posts and dispensaries countrywide. Thyolo district has about 18 primary health centres.

1.3.5.2 Secondary health care

Secondary care is defined by Joubert (2007:307) as “the first level of care to refer to”. District hospitals provide secondary care and serve as referral sites of primary health care centres. Thyolo District Hospital and Malamulo Mission Hospital are two secondary health care institutions in the Thyolo district.
1.3.5.3 Tertiary health care

This is where patients referred from district hospitals receive specialised health care (Joubert 2007:307). There are four central hospitals in Malawi: Mzuzu in the northern region, Kamuzu in the capital city, Lilongwe, in the central region, Queen Elizabeth in the commercial capital, Blantyre, and Zomba in Zomba city in the southern region. Queen Elizabeth Central Hospital is a tertiary referral centre for Thyolo District Hospital.

1.3.6 Organisation of the Ministry of Health

The ministry is headed by the minister appointed by the state president. The principal secretary who is also appointed by the president operates as the chief executive officer of the ministry to see to it that programmes are implemented and achieved. The Ministry of Health is composed of several divisions which include clinical, nursing, preventive, finance, planning, human resource, technical, and research to mention but a few.

1.3.7 Human resources for health

The health sector experiences shortage of health care providers who are comprised of medical doctors with degree in medicine and surgery, clinical officers with diploma in medicine, medical assistants who hold certificate in medicine, registered nurses with degrees and diplomas and enrolled nurses with a certificate in nursing and midwifery. According to Palmer (2006:27), the human resources situation was described by the Ministry of Health as “critical, dangerously close to collapse, collapsed, meltdown”. In February 2007, the overall vacancy rate in the ministry was 24% with nursing vacancies at 55%, doctors vacancies at 45% and specialist doctors at 77% (Malawi Ministry of Health (MoH) and GTZ 2007:30). In 2008, the shortage of nurses was severe to the extent that about 15 districts had less than 1.5 nurses per health centre, while 5 districts had less than 1 nurse per health centre (Banda 2008:3). In 2010 there were 2 doctors and 38 nurses per 100,000 population.

1.3.8 Health service financing

There is a strong political commitment to health issues but government faces huge financial constraints to adequately fund the health services. The per capita expenditure
on health stands at US$25. Bilateral development partners such as European Union, the United Nations agencies, Global Fund, and the World Bank contribute about 60% of the total health expenditure of Malawi. Funds for malaria control increased sharply in recent years. For instance, Malawi received US$49 million in 2007 and US$41 million in 2008 (WHO 2009:117). Domestic malaria funding is less than US$1 per person (WHO 2011:24).
1.4 STATEMENT OF THE RESEARCH PROBLEM

As was outlined above, malaria mortality and related complications in under-five children are important health problems in Malawi. This is in line with the realities in the developing world where malaria is endemic. Malaria is responsible for over 30% of all hospital deaths in children under the age of five years in Malawi and about 50% of these deaths occur within the first 24 hours of admission to health facilities (Chibwana 2008:2-5; Kazembe 2007:126; United States Aid for International Development (USAID) 2011:8). This health burden places pressure on the limited health care budget of Malawi. In order to reduce child mortality by the year 2015, as recommended by MDG 4 (reduce child mortality by two-thirds by the year 2015), it is essential to investigate mothers’ knowledge, attitudes and practices that may influence malaria-attributable mortality in under-five children in the health facilities in Malawi. The problem is that it is not known what mothers of under-five children do when their children become ill with malaria and what level of knowledge regarding malaria do mothers possess.

1.5 RESEARCH AIM/PURPOSE

The aim of this study was to describe mothers’ knowledge, attitudes and practices regarding malaria in children under five years old in order to recommend strategies that would improve health seeking behaviour of mothers.

1.6 RESEARCH OBJECTIVES

Objectives for this study were to:

- Determine mothers’ knowledge regarding malaria in children under five years old.
- Investigate mothers’ demographic and socio-cultural factors which may influence their knowledge, attitudes and practices regarding malaria in children under five years old.
- Describe practices (treatment-seeking behaviours) of mothers related to malaria in children under five years old.
1.7 RESEARCH QUESTIONS

- What knowledge about malaria in under-five children do mothers possess?
- What are mothers’ demographic and socio-cultural factors which may influence their knowledge, attitudes and practices regarding malaria in under-five children?
- What are the practices (treatment-seeking behaviours) of mothers relating to malaria in children under-five years old?

1.8 RESEARCH METHODOLOGY

Chapter 3 will present the research methodology in detail.

1.8.1 Research design

This is a descriptive cross-sectional study which was conducted in the form of a survey.

1.8.2 Research setting

The study was conducted at Thyolo District Hospital, southern Malawi from December 2013 to February 2014. The population comprised of mothers of children under-five years old admitted to Thyolo District Hospital with confirmed malaria.

1.8.3 Sampling

The researcher used convenience non-probability sampling method which involves non-random selection of the sample for the study.

1.9 DEFINITIONS OF KEY CONCEPTS

1.9.1 Malaria

Malaria is a mosquito-borne disease, caused by protozoal parasites of five species of the genus plasmodium that target red blood cells, with non-specific symptoms such as fever, malaise, headache and vomiting (Crawley et al 2010:1468; Jerrad et al 2002:23).
1.9.2 Malaria death

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

1.9.3 Under-five mortality

This is the probability of dying between birth and fifth birthday (Joubert 2007:22-28).

1.9.4 Knowledge

It is the state of knowing something. This includes information, understanding and skills gained through either education or experience (Oxford Advanced Learners Dictionary 2010:827). In this study, knowledge relates to mothers’ general knowledge on malaria and ways to treat and prevent it in children under-five years old.

1.9.5 Attitude

Attitude is how one thinks, behaves and feels about something (Oxford Advanced Learners Dictionary 2010:80). This research explored mothers’ attitude towards malaria and its prevention and treatment in under-five children.

1.9.6 Practice

According to Oxford Advanced Learners Dictionary (2010:1148), practice is a habit or custom that is carried out regularly. This study focused on what mothers do to assist an under-five year child attacked by malaria.

1.9.7 Duration of illness before hospitalisation

According to Oxford Advanced Learners Dictionary (2010:456), duration means period of existence. This is the period from start of symptoms to the time the child is brought to the health care providers for treatment.
1.10 ORGANISATION OF THE STUDY AND CONCLUSION

This chapter presented the brief introduction of the study. The following is the layout of this study:

Chapter 1 covers the orientation to the study

Chapter 2 reviews the literature

Chapter 3 focuses on the research design and methodology

Chapter 4 summarises the data analysis, presentation and description of the study findings

Chapter 5 discusses the study findings, recommendations and conclusion

This survey aimed at understanding mothers’ knowledge, attitudes and practices regarding malaria in children under-five years old. The findings will assist in the design of effective policies and strategies/interventions to reduce malaria-related mortality in under-five children.
CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter is a literature review of aspects relevant to malaria as well as mothers’ knowledge, attitudes and practices related to malaria. The King’s goal attainment theory is also discussed.

2.2 PURPOSE OF THE LITERATURE REVIEW

A literature review is indispensable in all research studies (Babbie & Mutton 2001:565; Burns & Grove 2009:90-91; Jubert 2007:66-67; LoBiondo-Wood & Haber 2006:79-80; Polit & Beck 2010:170). It is important for reasons which include:

• Framing new study findings against the background of what already exists
• Finding justifications for future studies
• Exploring other research results in order to enable successful completion of the current project
• Identify appropriate concepts
• Refine the research design, methodology and process that will be used to investigate the problem
• Development of an appropriate data collection instrument (questionnaire)

By doing the literature review, the researcher became aware of the various studies that had been conducted to assess the mothers’ knowledge, attitudes and practices (treatment-seeking behaviour) of malaria in children in Malawi and globally.
2.3 THE DISEASE MALARIA

2.3.1 Introduction

In this section the researcher discussed malaria as an infectious disease including causes, historical background and classifications.

2.3.2 Causes of malaria

Malaria is a disease caused by protozoa of the genus Plasmodium. It is transmitted to humans by the bite of female Anopheles mosquitoes. Transmission through transfusion of parasite infected blood and the transplacental route have also been reported. The disease is also known as aque, intermittent fever, marsh fever, and the fever (Beale & Block 2011:242; MoH 2007:13, Medecins Sans Frontieres (MSF) 2010:131). Most malaria infections are caused by five Plasmodium species namely P. vivax, P. ovale, P. malariae, and P. knowles which usually cause uncomplicated malaria. However, the fifth species, namely P. Falciparum, is responsible for malaria that can become severe malaria.

2.3.3 Historic background of malaria

According to Jombo et al (2011:10), anthropologists, palaeontologists, archaeologists and medical historians believe that malaria has affected mankind since time immemorial. Different herbs found in ancient Egyptian graveyards, excavations from Mesopotamia (presently Iran), Babylon (presently Iraq) and Chinese herbal pieces dating as far back as 5000 BC indicated different ailments the ancient people struggled to cure and malaria was one of them. Since those times the choices of anti-malarial drugs and prevention strategies have been related to social factors as well as what people knew about malaria.

The word "malaria" is derived from an Italian word, mala aria, meaning bad air because people believed that foul air emanating from the swamps was responsible for the fever (Beale & Block 2011:242; Munthali 2005:128).
2.3.4 Classification of malaria

Malaria is classified into uncomplicated malaria and severe malaria.

2.3.4.1 Uncomplicated malaria

Uncomplicated malaria is characterised by fever in the presence of peripheral parasitaemia. Other symptoms include chills, profuse sweating, muscle and joint pains, abdominal pains, diarrhoea, nausea, vomiting, irritability and loss of appetite. These can occur as a single symptom or in combination with more symptoms (MoH 2007:13).

2.3.4.2 Severe malaria

Severe malaria is a life-threatening form of malaria and is defined as the detection of P. falciparum in the peripheral blood in addition to the clinical and laboratory features. According to MoH (2007:13-14) the clinical and laboratory features include the following:

- Prostration: inability or difficulty to sit upright, stand or walk without support in a child normally able to do so, or inability to drink in children too young to sit
- Alteration in the level of conscious ranging from drowsiness to deep coma
- Cerebral malaria: unrousable coma not related to any other cause in a patient with falciparum malaria
- Respiratory distress
- Multiple generalised convulsions
- Circulatory collapse like shock due to septicaemia
- Pulmonary oedema,
- Jaundice and haemoglobinuria
- Acute renal failure
- Severe anaemia (Hb <5g/dl or Hct <15%)  
- Hypoglycaemia (blood glucose level <2.2mmol/l)
- Hyperparasitaemia (parasitaemia >200 000/µl in high transmission area, or 100 000/µl in low transmission area)
2.4 EPIDEMIOLOGY OF MALARIA

2.4.1 Epidemiology of malaria in the world

Globally, malaria accounts much higher morbidities and mortalities than that caused by tuberculosis (TB), HIV/AIDS and enteric fevers combined together. Presently malaria claims over half million deaths per year. WHO (2013:1) estimated that 3.4 billion people were at risk of malaria in 2012. It was estimated that there were 207 million cases and 627 000 deaths globally in that year.

About half of the world’s population is vulnerable to malaria. Over 85% of malaria cases occur in Africa, 10% in south-east Asia, 4% in Eastern Mediterranean, and 1% in the Americans. Approximately 85% of annual malaria deaths annually occur in under-five children (Jombo et al 2011:10; Mesa 2012:93; WHO 2011:1-3; WHO 2013:1).

2.4.2 Epidemiology of malaria in Sub-Saharan Africa

Sub-Saharan Africa is the most affected region where over 85% of all malaria deaths in the world today occur. This is because P. falciparum, the most dangerous of the five human malaria parasites, is responsible for the majority of infections and P. falciparum is found in this region. Other contributing factors include limited access to effective treatment, increasing parasite resistance to affordable and recommended medicine as well as delayed care-seeking. Malaria is responsible for 20% of under-five deaths due to all diseases in Africa (Peter, Manuel & Anil 2011:35; WHO 2011:1; WHO 2013:1).

2.4.3 Epidemiology of malaria in Malawi

According to NSO (2008:2) and Wilson et al (2012:219), the last housing and population census which was conducted in 2008 shows that Malawi has a population of 13 066 220.

There was an increase in money spent over the last few years to control malaria in Malawi. Yet the disease remains the most frequently reported cause of morbidity and mortality. Although all Malawians are vulnerable, under-five children and pregnant women have the highest risk of developing severe illness. About 3.7 million malaria
cases were captured in 2005 health registers countrywide. The figure increased to about 6.1 million cases in 2009. Malaria transmission in Malawi occurs throughout the year with significantly higher malaria morbidity and mortality during the peak transmission from October to April, following a heavy summer rainfall. Malaria is responsible for about 40% of all under-five hospitalisation and about 40% of all hospital deaths in under-five children (Mathanga et al 2012:213; MoH 2007:16).

2.4.4 Epidemiology of malaria in Thyolo district

The standard national surveillance system of Malawi does not give accurate estimates of incidence of malaria in the districts and the country as a whole. The data are based on health management information system (HMIS), a passive surveillance of outpatient and inpatient malaria cases recorded at government and mission health institutions. Malaria cases usually include those diagnosed either with or without parasitological confirmation (Mathanga et al 2012:213). In 2010, there were 143 376 under-five malaria cases recorded in Thyolo district HMIS, of which 173 died. The figures increased to 179 283 cases and 202 deaths in 2011 (Thyolo District HMIS [s.a.]). Many cases and deaths in remote areas are not even recorded. The reasons why the number of cases and deaths continue to increase at a time when efforts to control malaria are scaled up in the district are not known. Improved surveillance, reporting, and health service utilisation could explain the rise in number of reported under-five malaria cases and deaths.

2.5 PATHOPHYSIOLOGY OF MALARIA

The symptoms of malaria are attributed to the asexual (blood-borne) stage of the plasmodium parasite. The sporozoites are injected in the mosquito’s saliva into the human blood stream and circulate to the liver where host hepatocytes are infected. It takes weeks for the sporozoites to mature into schizonts. Schizonts of P. vivax and P. ovale remain dormant in hepatocytes as hypnozoites for weeks and months before causing clinical relapse. Merozoites are released into the circulation when the infected hypnozoites rapture. The merozoites move and attach themselves to and invade erythrocytes, where they grow as trophozoites. It takes about two to three days for the trophozoites to grow into schizonts (Bell & Molyneux 2007:141).
The features of uncomplicated or non-severe malaria mentioned above are mediated by inflammatory cytokine responses from the host (for example tumour necrosis factor) that are produced when erythrocytes containing mature parasites (schizonts) rupture and release the contents. Anaemia results from the destruction of the erythrocytes by malaria parasites. The infected erythrocytes circulate in the peripheral blood. These mature and adhere to the endothelial walls of small vessels in the brain, gut and other body organs. This process is known as cytoadherence and leads to the sequestration of huge parasitised erythrocytes in the microvascular beds. This is especially true of *P. falciparum* malaria. This sequestration process (the hallmark of severe falciparum malaria) is blamed for the life-threatening complications that characterise severe malaria including coma and acidosis (Bell & Molyneux 2007:141).

The spleen which acts as a filter of blood is overworked in order to clear the destroyed blood cells. Consistent malaria infections mean that the spleen works a lot and that can lead to enlargement and hardening or splenomegaly. The spleen is then palpable in children (Munthali 2005:142).

Convulsions can develop as a result of clumping of the parasitised red blood cells in the brain capillaries. Anaemia, convulsions and splenomegaly can be caused by a variety of infections. However, in malaria endemic countries like Malawi, the disease is mostly responsible for these signs and symptoms.

### 2.6 PARASITOLOGICAL DIAGNOSIS OF MALARIA

The two methods that are used for the parasitological diagnosis of malaria in Malawi are light microscopy and rapid diagnostic tests (RDTs). Light microscopy has the advantage that the cost is low, done by well trained staff and it has a high sensitivity and specificity. However, this method fails to detect malarial parasites in very small amounts.

RDTs detect antigens (proteins) produced by malaria which are present in the blood of infected or recently infected people. They are performed within 15 minutes and the coloured test line is an indication of a positive malaria result. Some RDTs are cheap but their sensitivity and specificity may vary. High temperature and humidity also affect the results. RDTs do not give an indication of parasite density and development stage. It is difficult to interpret a weak result (MSF 2010:132; MoH 2007:31).
Plasmodium falciparum malaria involves erythrocytes of all ages leading to higher levels of parasitaemia, compared to other malarial forms that attack only young cells. P. vivax and P. ovale malaria are found in the liver in the form of hypnozoites and remain in that form for months or years, causing several clinical malaria episodes.

Bronzan, McMarrow and Kachur (2008:300-3002) state that polymerase chain reaction (PCR) and serologic diagnosis are two other methods that can also be employed to diagnose malaria. PCR is used as a ‘gold standard’ malaria diagnosis in laboratory and research settings. It is more accurate than the microscope and can be used to identify Plasmodium sub-species. Serologic diagnosis with indirect fluorescent antibody (IFA) test or enzyme-linked immunosorbent assay (ELISA) could be used for examining prior exposure to Plasmodium parasites. Serologic diagnosis is not practical for routine diagnosis of malaria in Malawi, because IFA needs an electric fluorescence microscope and the development of antibodies is time consuming. It is not suitable for rural areas without electricity, like in Malawi.

2.7 MANAGEMENT AND CONTROL OF MALARIA

2.7.1 Introduction

Drug treatment of malaria is effective in controlling the disease and preventing its spread in the household and community in general as well as preventing the development of complications. The following paragraphs discuss the drugs that are used to treat malaria.

2.7.2 Malaria drugs

A number of drugs, their mechanisms of action and side effects are listed in table 2.1. Note that some drugs are used as combinations like artesunate-mefloquine and artesunate-amodiaquine.
<table>
<thead>
<tr>
<th>ANTI-MALARIAL</th>
<th>MECHANISM OF ACTION</th>
<th>SIDE EFFECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artesunate</td>
<td>Artesunate: endoperoxide bridge mixes with parasite heme. This is followed by release of radical species that stick to membrane proteins causing lipid peroxidation which destroys endoplasmic reticulum, inhibits protein synthesis and finally lysis of the parasite.</td>
<td>Artesunate-nausea, vomiting, itching, and dark urine.</td>
</tr>
<tr>
<td>Mefloquine</td>
<td>Mefloquine- it is an erythrocytic schizontocide. It increases the PH in the parasite’s vesicles leading to failure of heme process.</td>
<td>Mefloquine: vomiting, dizziness, diarrhoea, mental disorder (anxiety, ataxia and strange dreams)</td>
</tr>
<tr>
<td>Sulfadoxine/pyramethamine (SP)</td>
<td>This combination is schizontocide. Sulfadoxide interferes with folic acid synthesis in the parasite whereas pyrimethamine blocks folic acid reduction into active tetrahydrofolate coenzyme form.</td>
<td>Skin reactions in form of Steven-Johnson syndrome or toxic epidermal necrosis.</td>
</tr>
<tr>
<td>Artesunate-amodiaquine (AS+AQ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artemether/lumefantrine (LA)</td>
<td>Lumefantrine- the mechanism of action is not well understood. It appears to mix with hemin which results in blocking formation of beta-hematin.</td>
<td>Headache, dizziness, cough, anorexia, nausea, sleepiness, and tiredness</td>
</tr>
<tr>
<td>Quinine</td>
<td>It is not known. It is assumed that its combination with ferriprotoporphyrin results in parasite breakdown and/or erythrocyte membrane. It prevents the parasite from digesting the erythrocytes, haemoglobin or the parasite’s nucleoprotein synthesis.</td>
<td>Cinchonism (including tinnitus), headache, nausea, abdominal pains, rashes, visual disturbances (including blindness), confusion, hypersensitivity reactions, hypoglycaemia, blood disorders (thrombocytopenia), acute renal failure and photosensitivity.</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>It reverses 30s ribosomal unit, inhibiting pathogens’ protein synthesis. It is a prophylaxis of P.falciparum resistant to SP and chloroquine.</td>
<td>Nausea, vomiting, diarrhoea, dysphagia, headache, urticaria, photosensitivity reactions and Steven Johnson syndrome.</td>
</tr>
</tbody>
</table>

2.7.3 Treatment of malaria in Malawi

Following the development of resistance to anti-malarial mono-therapies and older combination therapy (chloroquine and SP), in 2007, Malawi government adopted Artemisinin-based combined therapy (ACT) as the recommended method of treatment for symptomatic malaria cases with confirmed parasitaemia (MoH 2008:1; WHO 2009:118).

2.7.3.1 The first-line treatment for uncomplicated malaria

The first-line treatment for uncomplicated malaria is lumefantrine-artemether (LA). The complete course of LA is six doses. The calculation of the number of tablets is based on the patient’s weight and age is used if weight cannot be measured. It is taken twice a day (morning and evening) for three days. It is recommended that the patient should take the first dose at the health facility followed by the second dose 8-12 hours later.

**TABLE 2.2: DOSAGE SCHEDULE FOR LA (120/20 FORMULATION)**

<table>
<thead>
<tr>
<th>BODY WEIGHT IN KG (AGE IN YEARS)</th>
<th>NUMBER OF TABLETS AND APPROXIMATE TIME DOSING</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0-14.9 kg (&lt;3)</td>
<td>Day 1: Start dose 1 After 8 hours 1 Am 1 Pm 1 Am 1 Pm</td>
</tr>
<tr>
<td>15-24.9 kg (3-8)</td>
<td>Day 2: 2 Am 2 Pm 2 Am 2 Pm</td>
</tr>
<tr>
<td>25-34.9 kg (9-14)</td>
<td>Day 3: 3 Am 3 Pm 3 Am 3 Pm</td>
</tr>
<tr>
<td>35 kg or more (&gt;14)</td>
<td>Day 4: 4 Am 4 Pm 4 Am 4 Pm</td>
</tr>
</tbody>
</table>

MoH (2007:41)

2.7.3.2 Second-line treatment for all age groups

Artesunate+Amodiaquine is the recommended second-line anti-malarial drug in Malawi.
TABLE 2.3: DOSAGE SCHEDULE FOR ARTESUNATE+AMODIAQUINE

<table>
<thead>
<tr>
<th>WEIGHT (KG)</th>
<th>DOSE IN MG AND NUMBER OF TABLETS</th>
<th>Artesunate 50mg</th>
<th>Amodiaquine 153mg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day 1</td>
<td>Day 2</td>
<td>Day 3</td>
</tr>
<tr>
<td>5.0-6.4</td>
<td>1/2</td>
<td>1/2</td>
<td>½</td>
</tr>
<tr>
<td>6.5-11.9</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>12.0-24.9</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>25.0-34.9</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>&gt;35</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

MoH (2007:41)

2.7.3.3 Supportive treatment

An antipyretic drug is administered to any patient with hyperpyrexia (MoH 2007:53). Paracetamol (Panado) and ibuprofen are the recommended options. In addition, caretakers are encouraged to give extra fluids and continue breast feeding where applicable.

2.7.3.4 Management of severe malaria

Parenteral quinine is the recommended medicine for severe malaria administered intravenously. However, intramuscular route is the alternative where there is no feasibility of intravenous route. The intramuscular quinine is administered as follows: 10mg (0.2ml) per body weight injected into the upper outer thigh. This is usually a pre-referral treatment.

2.7.3.5 Management of severe malaria at the referral hospital

Quinine is administered intravenously or intramuscularly if the intravenous route is not possible. The initial (loading) dose of 20mg of quinine per kg body weight is mixed with a solution of 5% dextrose or half strength darrows calculated at 10ml per kg and administered over 3-4 hours. Thereafter, 10mg/kg of the body weight is subsequently given to the patient every 12 hours in the same way. Quinine is stopped when the patient is able to drink and lumefantrine-artemether twice daily is prescribed (MoH 2007:54).
The complications namely shock, severe anaemia, metabolic acidosis, spontaneous bleeding, acute pulmonary oedema, acute renal failure and other infections are also managed if they are present (MoH 2007:52).

2.8 PREVENTION, CONTROL POLICIES AND STRATEGIES OF MALARIA

2.8.1 Introduction

Strategic approaches for malaria control focus on two areas which include prevention and case management. These strategies prevent transmission of the Plasmodium parasite from mosquito vectors to humans and the subsequent development of the infection (Mutero, Schlodder, Kabatereine & Kramer 2012:2; UNICEF 2010:10; WHO 2011:4). Methods that are used to control malaria in Malawi are discussed in this section.

2.8.2 Malaria prevention through malaria vector control

Malaria vector control aims to protect people against infective malaria mosquito bite and reduce malaria transmission at community level through low parasite density, reduced longevity of the parasite and significantly reduced human-vector contact.

The two most common and effective used interventions are insecticide treated bed nets (ITNs) and indoor residual spray (IRS). These two interventions reduce human-vector contact and shorten the life-span of female mosquitoes thereby reducing the time to transmit the parasite (Mutero et al 2012:2; UNICEF 2010:10; WHO 2011:4; WHO 2013:1).

2.8.2.1 Insecticide treated mosquito bed nets (ITNs)

ITNs could be long lasting insecticide treated mosquito bed nets (LLINs) or ordinary nets that are treated with an insecticide. They work by protecting the individual sleeping under the net because the nets prevent human-vector contact. The ITNs offer community protection by killing the mosquitoes that touch them, lowering the malaria transmission intensity in the area. The efficacy of the ITNs depends largely on how effective the insecticide is and if it is used regularly. It is believed that regular use of
ITNs reduces child mortality by more than 20% (UNICEF 2010:10; WHO 2011:4; WHO 2013:23).

The distribution of subsidised ITNs to pregnant women and under-five children in Malawi was launched in 1998 through public health facilities and distribution campaigns. The possession of ITNs has significantly improved from 49.5% in 2006 to approximately 63.5% in 2010. There is also an increase in use of ITNs for pregnant mothers and under-five children from 26% to 49% and 23% to 59% respectively. Overall the proportion of households owning ITNs in this country is 55% in urban and 35% in rural areas (Larson et al 2012:1; MoH 2012:24; UNICEF 2010:17; Wilson 2012:220). About 3.7 million LLINs were distributed to Malawian under-five children and pregnant mothers since 2008 (Mathanga et al 2012:213; Roca-Filtrer et al 2012:272).

Between 2009 and 2011, A total of 38, 965 ITNs were distributed to under-five children and pregnant women in Thyolo district (HMIS records).

2.8.2.2 **Indoor residual spray (IRS)**

The practice of IRS means that long acting insecticides are applied prior to the transmission season of malaria to the inner walls of the houses and other structures in which people sleep. This will kill the resting female anophelens mosquitoes. This method effectively reduces malaria morbidity and mortality, provided that more than 80% shelters in the community are treated (WHO 2011:4).

A pilot indoor residual spray programme was launched in Malawi in 2007 in the Nkhotakota district of the central region. The programme was expanded to 6 more districts along Lake Malawi and the Shire valley by 2010. At a national level, this programme is implemented in pilot districts, selected sugar plantations and private urban houses. Only less than 9% of the households countrywide have been sprayed (Mathanga et al 2012:213, Roca-Filtrer et al 2012:272; MoH 2012:22).
2.8.2.3 Intermittent preventive treatment during pregnancy (IPTp)

In combination with ITNs, IPTp is a tool to prevent malaria in pregnant women in malaria endemic countries. Two doses of anti-malarial drug are administered during the second and third trimesters of the pregnancy at an interval of at least 4 weeks. This intervention reduces anaemia in women as well as placental malaria, premature deliveries and low birth weight. Sulfadoxine/pyramethamine (SP) is the current recommended drug for IPTp and it is safe in pregnancy. For HIV-positive women or with an unknown HIV status residing in areas of high HIV prevalence (>10% among pregnant women) at least 3 doses of IPT is given (Mathanga et al 2012:214; MoH 2007:64).

This intervention has been recommended in Malawi since 1993 but the coverage is still poor. According to Mathanga et al (2012:214), national surveys of IPTp indicate that women attend antenatal clinics in the country but only 47% to 60% get more than 2 doses of IPT.

2.8.2.4 Prompt malaria treatment

Prompt and effective treatment of malaria with an effective anti-malarial drug within 24 hours of fever onset is one of the strategies used to control malaria in many countries, and in Malawi in particular (Wilson et al 2012:220). ACT is the drug of choice for P. falciparum, whereas chloroquine remains effective for P. vivax malaria.

However, this intervention faces several challenges. Malaria cases do not present promptly and the infected people seek health care outside the health facilities in Malawi. Mathanga et al (2012:214); Wilson et al (2012:220), report that in Malawi, between 2004 and 2010, the proportion of children under the age of 5 years who used appropriate anti-malarial drug treatment remained at less than 25%. However, for patients who got the appropriate therapy there was a 75% adherence to the ACT which means taking the drug within the recommended 72 hours.

Another challenge is that fever in children is taken to be equivalent to malaria. This is not true. Malaria diagnosis with microscopy and RDTs are necessary prior to treatment although diagnostic resources remain a challenge in many developing and malaria
endemic countries like Malawi. The consequence of treating any patient with fever as a malaria case is that parasites develop resistance to anti-malarial drugs, posing a threat to this intervention.

2.9 MOTHERS’ MALARIA KNOWLEDGE, ATTITUDES AND PRACTICES

2.9.1 The need to be aware of mothers’ knowledge, attitudes, and practices regarding malaria in children under-five years old

Children under the age of 5 years need special attention when it comes to malaria diagnosis and treatment. They are the most affected group in the communities. They are unable to explain how they experience a severe infection and its management. They depend on others for their treatment, and in most cases it is the mothers who receive and administer medicines (Frankel & Lalou 2009:1). In the fight against most diseases, mothers are important partners and can be among best target groups for health promotion. In Malawi, mass media, maternal and child health facilities, and public campaigns against malaria have introduced educational programmes to enable caregivers to understand malaria symptoms and signs at an early stage in order to promote early and appropriate health care seeking behaviour.

2.9.2 Research regarding malaria in under-five children and their mothers

Several studies have been undertaken throughout the malaria world to assess mothers’ knowledge, attitudes and practices regarding malaria in under-five children. Correct information about the disease is a prerequisite for better adoption of interventions to control it. It is believed that early detection and access to prompt, affordable and effective treatment is regarded as the cornerstone of successful malaria control.

Littrell, Gatakaa, Evance, Poyer, Njogu, Solomon, Munroe, Chapman, Goodman, Hanson, Zinsou, Akulayi, Raharinjatovo, Arogundade, Buyungo, Mpasela, Adjibabi, Agbango, Ramarosandratana, Coker, Rubahika, Hamairiza, Shewchuk, Chavasse, and O’Connell (2011:1) conducted a study to monitor fever treatment behaviour in six African countries (Benin, Democratic Republic of Congo, Madagascar, Nigeria, Uganda and Zambia). The researchers reported that most mothers in Benini, Madagascar,
Nigeria, Uganda and Democratic Republic of Congo seek malaria treatment for their children outside their homes and private sector outlets.

Howard, Shafi, Jones and Rowland (2010:1-4) undertook a study in Afghanistan on insecticide-treated net purchasing, coverage and usage. The study showed that women obtained malaria knowledge from clinic staff, their husbands and female peers. In addition, men were primarily responsible for household decision-making including treatment options. Similarly, the nomadic Fulani women of Nigeria need a household head’s consent for a sick child to be treated outside their home and fathers rarely take children to the health facilities. Among the nomadic Fulani of Nigeria, it was also found that traditional medicine and rituals are used to reduce the severity of malaria related fever which is believed to be triggered by drinking fresh milk during rainy seasons, eating or perceiving the aroma of fresh maize being roasted, cooked or observing red or yellow flowers. The nomads use ITNs, clothing, herbs burned to create smoke and plant repellents to prevent mosquito bites (Akogun, Gundiri, Badaki. Njobdi, Adesina & Ogundahunsi 2012:1).

Klein, Lewis, Jung, Llinas and Levin (2012:3-4) in their study on relationship between treatment-seeking behaviour and artemisinin drug quality in Ghana found that mothers’ most popular first, second and third source of treatment were market drug vendors, herbal remedies and public health facilities respectively. About 97% of the mothers mentioned drugs/medicine sellers as one of their best sources of anti-malaria drugs and as many as 86% of the caregivers opted for traditional medicines.

In most rural African areas and elsewhere in developing countries, people rely on traditional medicines. Why do people still use traditional medicine in the 21st century? Studies have shown that traditional medicine is effective as it is known that two major anti-malarial drugs widely used today came from the indigenous herbs, that is, quinine and artemisinin from Peruvian and Chinese ancestral treatments respectively. People continue relying on traditional medicine because they live in remote areas where modern medicine is not accessible. They have the habit of seeking traditional medicine. Furthermore, people prefer traditional medicine to modern medicine because they believe that they are effective and have few side effects. They have experienced a failure with modern medicine and resort to native medicine. Some people avoid health facilities because they are expensive, unfriendly, dangerous, corrupt and have
counterfeit and ‘fake’ drugs (Graz, Kitua & Malebo 2011:1; Gyasi, Mensar, Adjei & Agyemang 2011:40).

In a related study in south-western Nigeria on knowledge, attitudes and practices about malaria in an urban area, Adedotun, Morenikeji and Odaibo (2010:155) reported that only 13.7% of children suffering from malaria got prompt treatment with correct dosage in 38.7% of them. About 90% of the under-five malaria cases received home treatment with herbs and drugs from vendors. The researchers also reported that 79.7% and 44.3% of the respondents used ITNs and herbs as methods to prevent malaria respectively. However, only a small number of children (16.7%) slept under the ITNs.

Research has shown that mothers have some knowledge regarding malaria in children under-five years old. In a study in Enugu, Nigeria on caregivers’ knowledge, attitude and practice about childhood malaria and treatment in rural and urban communities, Oguonu, Okafor and Obu (2005:409-412) found that 99% of urban and 74% of rural caregivers were aware of malaria as a killer disease. Majority of the respondents (81%) mentioned fever as a symptom, weakness (36%), vomiting (23%), appetite (20%), cough (9%) and body pains (9%). However, both groups did not know that under-five children and pregnant women were vulnerable to the disease and the use of self-medication was rampant (urban 79%, rural 20%). The caregivers had a good knowledge of anti-malarial drugs like chloroquine (urban 23%, rural 15%) and SP (urban 50%, rural 6%) although in wrong dosages. About 5% of the respondents used traditional medicine, 70% visited health facilities, and 22% bought drugs from patent medicine shops. The respondents were also familiar with malaria preventive interventions such as ITNs (urban 23%, rural 56%) but their usage was very poor (urban 7%, rural 2%).

Okeke and Okeibunor (2010:62-67) studied rural-urban differences in health-seeking for childhood malaria in south-east Nigeria and found that rural and urban mothers significantly differed in the way they sought treatment for malaria. Majority of urbanite mothers visited health facilities while most rural mothers (62%) practiced self-treatment bought from over-the-counter and patent medicine vendors, and used traditional herbs. Rural women sought health care services when the child was not recovering from the illness and this behaviour resulted in treatment delay.
A study in Turbo, Colombia, aimed to assess care-seeking patterns and barriers to appropriate treatment in febrile children reported that mothers (95%) recognised fever and treated it promptly at home with baths, biomedicine (antipyretic drugs) and traditional remedies. Only 36% of children received treatment at a health facility within 36 hours from the time fever was noticed by the mothers. There was no prompt treated to the extent that children in the study got treatment 6 days after the onset of illness (Mesa 2012:93-98).

Smith, Bruce, Gueye, Helou, Diallo, Gueye, Jones and Webster (2010:1-6) conducted a study in rural Senegal to investigate treatment-seeking process for fever in children. The study showed that overall 61.6% of caretakers sought treatment and only 40.3% were treated promptly within 48 hours. Only 6.2% (3.0% from public provider, 3.0% from community source, and 0.2% from the vendors) of the children received ACT within 48 hours.

Iwelunmor, Idris, Adelaku and Airhihenbuwa (2010:1-4) in a study aimed to understand mothers’ treatment decisions about their child febrile illness in South-west Nigeria showed that mothers knew that there was proper malaria treatment at health centres. Some mothers (34%) reported teething as the cause of child’s illness, 52.1% thought that the child’s illness was manageable at home because it was not serious. This is in agreement to the findings of a study conducted in Rajasthan, India by Yadav (2010:235). The study reported that mothers with severely ill children in Rajasthan visited health facility more often than mothers with children judged not to be severely ill.

In a similar study in Jengre, north-central Nigeria which looked at the impact of health education on knowledge of malaria, its treatment and prevention among under-five caregivers, the researchers reported that mothers (40.6%) had adequate malaria knowledge including cause, transmission, prevention and treatment. Respondents (56%) practised self-treatment, 28% visited the patent medicine vendors and 16% used hospitals. Majority of mothers (68%) sought fever treatment less than 8 hours, 16% between 8-24 hours and 16% more than 24 hour. In the event that there was no improvement, the second line action in 50% of the children was health facilities, 45.5% got treatment from patent medicine vendors, and 4.2% took left-over drugs. At the onset of fever 32% tepid sponged their children or gave paracetamol, and 68% bathed the
children with cold water, offered cold drink and did nothing at all (Chirdan, Zoak & Ejembi 2008:112-119).

In contrast, a study in Papua New Guinea about seeking treatment for symptomatic malaria showed that home treatment and left-over drugs were less likely to be used. Street vendors and shops are rarely used for treatment of malaria (Davy, Sicuri, Ome, Lawrence-wood, Siba, Warvi, Muller & Conteh 2010:1-9). The inconsistency of study findings indicates the complexity of mothers’ knowledge, attitudes and practices towards malaria in under-five children. It reflects demographic, economic, and socio-cultural aspects of the mothers.

Jombo et al (2011:10-14) investigated malaria self-medications and choices of anti-malarial drugs among residents of a malaria community in West Africa. They reported that respondents (41.1%) attended health facilities, (36.0%) bought drugs from pharmacy or chemist shop, (10.7%) took traditional herbs, (0.5%) did nothing at all.

Githinji, Herbst, Kistemann and Noor (2010:1-3) conducted a study in rural area of western Kenya on mosquito net ownership, use and quality and found that some people own but never use the bed nets although they are regarded as one of the most effective interventions to prevent malaria. Of all the distributed nets, 236 (15%) were not used, of which 88 (37%) had not been opened from the manufacturers’ packet. The respondents received 63% of these unopened nets free of charge. Children slept in poor quality nets with holes and required treatment.

2.9.3 Mothers’ knowledge, attitudes and practices regarding malaria in under-five children in Malawi

Holt, Kachur, Marum, Mkanda, Chizan, Roberts, Macheso and Perise (2003:491-493) carried out a study in Blantyre, Malawi to investigate care seeking behaviour and treatment of febrile illness in under-five children. Though it is a rather old household survey, the picture today may not be totally different. The study revealed that 72% of febrile children received medication at home and 12.2% of them received a recommended anti-malarial drug. Overall 37.4% of the children were treated promptly.
However, 62.6% received inappropriate anti-malarial medicine. Mothers attributed the febrile illness to malaria (69.8%), pneumonia (11.0%), teething (9.9%), flu (8.9%), diarrhoea (6.0), and mauka (local illness term) (2.5%). Some caregivers mentioned more than one diagnosis. About 2% of the mothers reported headache, worms, tetanus, and cholera as responsible for the febrile illness. Majority of mothers (78%) bought anti-malaria drugs from a shop, (13.6%) bought the drug from a health facility, (8.5%) received it from a friend, and less than 4.0% visited traditional healers during the whole illness period. The survey also revealed that mothers (7.1%) sought treatment at the health facilities on the first day, (27.0%) on the second day, (14.6%) on the third day, (4.7%) on the fourth day, (2.9%) on or after the fifth day and (3.4%) did not receive any treatment at all.

Munthali (2005:127-136), conducted a study in rural Malawi to investigate management of malaria in under-five children. It was reported that mothers started with traditional medicine to manage malaria followed by western anti-malarial drugs if there was no improvement. Traditional healers were consulted if people suspected witchcraft as the cause of the disease.

2.10 FACTORS INFLUENCING MOTHERS’ KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING MALARIA IN CHILDREN UNDER-FIVE YEARS OLD

2.10.1 Introduction

Most malaria control strategies are embedded in the promotion of health and biomedical interventions especially the use of ITNs, IRS with insecticide and prompt treatment. However, malaria risk behaviours are associated with socio-cultural beliefs and practices which predict the use or non-use of the interventions. This section presents the factors that are related to mothers’ knowledge, attitudes and practices regarding malaria in under-five year old children.

2.10.2 Socio-cultural factors

Culture plays a role in the prevention and treatment of malaria in under-five children. Cultural practices that affect proper treatment-seeking for malaria are cultural
perceptions of malaria as an ordinary fever, wrong perceptions of severe malaria, and fathers’ role as decision makers in the households. For example, a study in southern Tanzania revealed that some patients do not use bed nets for reasons related to witchcraft (Dunn, Mare & Makungu 2011:415). Another study in Papua New Guinea about seeking treatment for symptomatic malaria showed that people use traditional healers because they believe that the illness is caused by sorcery or witchcraft and the failure of modern medicine (Davy et al 2010:1-9).

In a study in south-west Ethiopia about determinants of malaria treatment delay in under-five children, Getahun et al (2010:1-5) reported that mothers of children who were monogamously married, experienced adverse effects of anti-malarial drugs, who had no history of child death, and who had transport problems to visit the health facilities delayed in seeking malaria treatment for under-five children. Males are responsible for decision-making in monogamous marriages and delay in making treatment choices compared to polygamous marriages where men are always away and women decide about the treatment of the child.

2.10.3 Demographic factors

Demographic variables can have an impact on mothers’ knowledge, attitudes and practices regarding malaria in under-five year old children. Watsierah et al (2010:1) conducted a study in Western Kenya on anti-malarial use and found that anti-malarial drug used was related to age of the respondent, household size, household head, household source of income, monthly income, duration of use, dosage of drugs taken, and source of the drugs.

Githinji et al (2010:1-3) conducted a study in rural area of western Kenya on mosquito net ownership, use and quality. The study showed that children from poor households slept under nets with holes compared to the well-to-do households. In a similar study in Rajasthan, India, mothers from rich families utilise health facilities for treating fever in under-five children more than those from poor households (Yadav 2010:235).

Ouathara, Raso, Edi, Utzinger, Tanner, Dagnogo and Koudou (2011:6) assessed malaria knowledge and long-lasting insecticide treated net use in rural community of central Cote d’voire. They confirmed that the wealthiest people used modern medicine
or purchased drugs from street markets compared to the poorest people who used traditional medicine. They also found that the rich used ITNs as a preventive measure against mosquitoes, whereas the poor burnt plants to produce smoke that chased away the mosquitoes. People did not like mosquito bed nets because they were associated with heat, suffocation and bad smell. A study in six African countries (Benin, Democratic Republic of Congo, Madagascar, Nigeria, Uganda and Zambia) showed that children from rich families in Benin, Democratic Republic of Congo, Madagascar and Nigeria were more likely to receive ACT than poor children (Littrell et al 2011:1).

Getahun et al (2010:1-5) in a study in south-west Ethiopia about determinants of malaria treatment delay in under-five children reported that mothers with history of death of an under-five year old child were aware of the risk and severity of malaria and sought treatment in time. They also determined that educational level and occupational status of the mothers were not related to delay in diagnosis and treatment of malaria in under-five children. In addition, the study showed that age and sex of the child did not influence the malaria management in under-five children. In contrast, studies by Chirdan et al (2008:112-119) in Nigeria, Klein et al (2012:3-4) in Ghana and Yadav (2010:235) in India found that education was related to choice of malaria first line treatment. The uneducated were more likely to opt for informal health services (visit drug shops, use traditional herbal medicine).

Mothers’ location and education status together influence the treatment-seeking behaviour and malaria knowledge. Studies by Holt et al (2003:491-493) in Blantyre, Malawi and Okeke and Okeibunor (2010:62-67) in south-east Nigeria noted that prompt treatment of febrile illness in children was associated with educational status and area of residence of the mothers. Households in rural location with less than primary level education were likely to delay febrile illness treatment.

Jombo et al (2011:10-14) investigated malaria self-medications and choices of anti-malarial drugs in West Africa. The researchers reported that knowledge related to malaria among the respondents were associated with increasing educational level (from 25.5%, 73.4%, 98.8% to 100% among those with nil, primary, secondary and tertiary education respectively), being married compared to unmarried, having children, and family wealth. Anti-malarial knowledge was strongly related to increasing wealth index from 80.8% to 100% in the first to the fourth quartiles respectively. Occupation and age
were not contributory factors. Anti-malarial knowledge was the same between those with children under the age of five years and those with older children.

2.10.4 Health care system factors

The most important health system factors influencing health care seeking are quality and availability of health care services, physical access, financial access, and performance of health care workers.

2.10.4.1 Availability and quality of health care services

The nature of health care system in any country may influence mothers’ attitude and practices towards treatment for their sick children. Delivery of hospital care requires sound management, and adequate human and material resources which are very limited in most developing countries, thus compromising quality care. In a study in 13 public hospitals in north-east Tanzania to investigate clinical assessment and treatment in children’s wards, Reyburn, Mwakasungula, Chonya, Mtei, Bygbjerg, Poulsen and Olomi (2008:132-135) reported that 95% of the consultations were done by clinical officers and medical assistants. Qualified doctors were not available to assess the children. Temperature was not checked in 895 children with fever. Clinical assessments were poorly done in the outpatient department as well as in the wards. In such environments mothers opt for informal health care settings. In a similar study by Iliboudo, Chou and Huang (2012:1) in rural Burkina Faso, primary health care system workers failed to refer children properly. Only 14.4% of severe malaria under-five children were correctly diagnosed, of which 60.6% were referred correctly. The health worker’s incompetence results in demoralisation of the mothers.

of appropriate services at public clinics, a long waiting time, overcrowding, and appropriate drug prescription in the absence of laboratory test, lack of urgency, and partial drug administration like injections not administered as prescribed.

In the Malawian context, health services are not equitably distributed especially in rural areas due to inadequate human and material resources. Doctors and registered nurses leave the country for greener pastures in the foreign lands. This means that less educated health workers (medical assistants, clinical officers and enrolled nurses) form the backbone of the health care system. Clients who need immediate attention become irritated after long wait caused by the critical shortage of staff and work overload. Health workers lack time to communicate amongst themselves and patients or guardians through documentation (records) of care because of heavy workload. Sometimes nurses are verbally abused, threatened and assaulted by the clients. The mothers who experience this atmosphere are likely to use the informal health care services (Gondwe & Brysiewicz 2008:61-63).

2.10.4.2 Physical access

2.10.4.3 **Financial access**

Lack of money also affects utilisation of health services in time. Studies by Deressa and Ali (2009:8) in Ethiopia, Ewing, Laloo, Phiri, Roca-Felttrer, Mangham and SanJoaquin (2011:1) in Chinkwawa, Malawi, I dowu et al (2008:210), Kizito et al (2012:1), Okeke and Okeibunor (2010:62-67) in Nigeria, and Mesa (2012:93-98) in Colombia reported that cost was one of the reasons for not seeking medical treatment. Most mothers in developing countries cannot afford quality services at private facilities. In Malawi, people who live in hard-to-reach areas pay a lot of money compared to those living near the health facilities. In hard-to-reach areas, travelling costs are higher in wet season (high malaria transmission season) than in dry season due to impassable roads. This negatively affects prompt treatment-seeking behaviour.

2.10.4.4 **Performance of health workers**

According to Deressa and Ali (2009:8); Kizito et al (2012:1) and Okagun et al (2012:1) mothers are influenced by their previous experiences with health workers and/or the experiences of others. How the caregiver viewed previous treatments is important. Rude health workers (nurses, clinicians etc) influence the treatment-seeking behaviour of mothers-first choosing traditional medicine and home treatment when children are sick.

The public health sector has, by and large, been under-utilised due to certain weaknesses. The listless communication and lethargic attitude of health providers has undermined patients' confidence. However, the private sector in developing countries has flourished because of its access, shorter waiting time, longer or flexible opening hours, better availability of staff and drugs and empathetic attitude of health providers.

2.11 **THEORETICAL FRAMEWORK: KING’S THEORY OF GOAL ATTAINMENT**

2.11.1 **Introduction**

The following lines present King's Theory of Goal Attainment which will form the theoretical framework for this study.
2.11.2 Theory of goal attainment

In 1981 King came up with a Theory of Goal Attainment which is based on the philosophy of human beings interacting with their environments. It is a middle-range theory derived from the conceptual systems.

2.8.2.2 Development of goal attainment theory

The development of Goal Attainment Theory was mainly influenced by interpersonal system. “Although personal systems and social systems influence quality of care, the major elements in a Theory of Goal Attainment are discovered in the interpersonal systems in which two people, who are usually strangers, come together in a health care organisation to help and to be helped to maintain a state of health that permits functioning roles” (King 1981:142). Human interactions, perception, communication, role, stress, time, space, growth and development, and transactions are the ten concepts from personal and interpersonal systems that build the Theory of Goal Attainment. Goal attainment is achieved through interactions between the health care providers and the patients or guardians in case the patient is a child.

2.11.3 Utilisation of king’s goal attainment theory

The knowledge in the theory can be used in any situation that involves human interaction to accomplish the set goals (Killeen & King 2007:54). Stress, roles, space and time are factors which affect the attainment of goal. The concepts of interaction, transaction, and perception form the backbone of transaction process model. Transactions are the mainstay of goal attainment because it is where the goal is set (Kear 2006:31). The health care providers from different disciplines (doctors, nurses, dieticians, pharmacists, laboratory technologists etc) also interact (verbal and non-verbal communication) among themselves to help the patient (child) better. This helps in achieving the goal of nursing and health care interventions, which according to King, is health of human beings, families and communities. Recently, spirituality was added to the concept of personal system as a part of human beings (Khowaja 2006:46).
The researcher used this conceptual system as a theoretical framework in selecting variables, research questions formation, data collection instrument development (pre-tested research questionnaire), interpretation and discussion of the findings of this study. It is important to appreciate that not all of King’s concepts may be applicable to this study, thus only applicable concepts will be used. The application of the model will therefore enable the researcher to investigate mothers’ knowledge, attitudes and practices on malaria attacks in under-five children, contributing to malaria-related mortality in a health facility in Thyolo District, southern Malawi and also to frame the findings of the study.

2.12 CONCLUSION

This chapter has presented the literature review and discussed the overview of malaria and its pathophysiology including epidemiology in the world, in Sub-Saharan Africa, in
Malawi, and in Thyolo district of Malawi in particular. The chapter also discussed parasitological diagnosis, management and control, and preventive measures of the disease. The chapter also looked at research regarding mothers’ knowledge, attitudes and practices towards malaria in under-five children as well as the King’s theory of goal attainment.
CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

Chapter 2 presented a comprehensive and detailed literature review of mothers’ knowledge, attitudes and practices (treatment-seeking behaviours) related to malaria locally and globally. Malaria in under-five children was also covered. This study aimed to investigate mothers’ knowledge, attitudes and practices regarding malaria in under-five years old. These factors may contribute to malaria-attributed mortality in this age group. The findings of this research would enable the researcher to make recommendations that could improve mothers regarding malaria so that practices can subsequently change in order to reverse the malaria-related deaths in Thyolo District, Southern Malawi.

This chapter describes the research design and methods used in this study including the study design, the study population, sample, data collection method, research instrument, validity and reliability, data analysis plans, ethical considerations, and scope and limitations of the study.

3.2 THE RESEARCH DESIGN

A research design is a blueprint developed to tackle a research problem. It is the ‘architecture’ or structure that is used by the researcher to answer the research questions and achieve research objectives (Burns & Grove 2011:253; Joubert 2007:77; Polit & Beck 2010:74). It helps in maximising control over factors that could interfere with the validity of the study findings. In this study, a non-experimental quantitative descriptive research design is used. Quantitative research design is a study design which involves precise measurements and quantification (Polit & Beck 2010:68; Schmidt & Brown 2012:144). This design entails reductionism, logical deductive reasoning, a reasonable control by the researcher, use of a structured data collection instrument, statistical analysis of data, and in some cases generalisation of the study
findings (Polit & Beck 2010:16-17). In this study reductionism was achieved by dividing the study theme into different parts and studied them separately. Data collection and analysis involved the use of a structured data collection instrument (pre-tested structured questionnaire) and statistical analysis methods. The development of a research instrument (questionnaire) was based on a thoughtfully conducted literature review by the researcher. Logical deductive reasoning was done by generating conclusions from questionnaires filled in by a sample of mothers of under-five children who suffered from malaria attacks and made appropriate generalisations.

A descriptive study design is a research design in which no clinical trials or manipulation of variables take place. There is no experimental intervention (Burns & Grove 2009: 237; Marroni & Myer 2007:77, Polit & Beck 2010:236). The researcher measures the exposures and outcomes as they occur in a natural setting of the phenomena (Brink, Van der Walt & Rensburg 2012:112). It is suitable where little is known or no study has been undertaken to understand the concepts. According to Joubert (2007:77), descriptive designs aim at observing, describing and documenting aspects of an event as it naturally occurs in a given population. This study had a descriptive component to all variables. This study was descriptive in nature because it was expected to unearth new knowledge about what mothers know and believe about malaria in under-five children in the Thyolo District of Malawi.

Cross-sectional research method was used because data were collected at one particular point in time (Burns & Grove 2009:241; Polit & Beck 2010:239; Schmidt & Brown 2012:156). The sample in cross-sectional design is assembled without any reference to exposure and outcome. The researcher used a survey as a method in this design.

The cross-sectional design is easy and cheap to conduct. It is useful for assessing needs of the population as well as the relationship between exposure and fixed variables such as age and ethnicity and the outcome. The weakness of this research design is that the conclusions may be limited to a specific period of time and are subject to further tests according to data available at other times. Furthermore, with cross-sectional design it is difficult to establish exposure-condition temporal relationship where exposure status and outcome are examined together (Babbie & Mouton 2001:92; Joubert 2007:85-87).
3.3 RESEARCH METHODS

According to Polit and Beck (2010:16), research method is the method employed by the researchers to structure their study to answer the research questions and achieve the study objectives. In this study the researcher used a survey as a research method. A survey is a descriptive or correlational research or simply a non-experimental study in which data collection is done by use of questionnaires or personal interviews like face to face (Bowling 2009:214; Burns & Grove 2011:264). The main advantage of a survey is that a phenomenon is studied in its natural environment (no manipulation). However, there are disadvantages which include difficulties to establish cause-effect relationship (Bowling 2009:217).

The following paragraphs outline the, population and sample, sampling criteria, the data collection, validity and reliability of the measuring instrument, data analysis, ethical considerations, and scope and limitations of the study.

3.4 POPULATION AND SAMPLE

The population of a study includes all the individuals who meet the sampling requirements or criteria (Burns & Grove 2011:290; Polit & Beck 2010:306). The population of this research composed of all mothers of children suffering from malaria in Thyolo district.

The target population is defined as subjects with similar attributes to that of the research subjects to whom the researcher may generalise his findings (Joubert 2007:94; Schmidt & Brown 2012:248). In this study the target population consisted of all mothers of under-five children with confirmed malaria and admitted to the paediatric ward, Thyolo District Hospital in 2013-2014.

Accessible population is part of the target population that is accessible to the researchers for the purpose of the study (Schmidt & Brown 2012:248). In this study, the mothers of under-five children who were admitted to Thyolo District Hospital with a confirmed diagnosis of malaria during the data collection period in 2013-2014 provided the accessible population.
3.4.1 Inclusion/exclusion criteria

Eligibility criteria include all features or characteristics that an individual should have in order to become part of the sample (Schmidt & Brown 2012:250). In this study criteria included the following:

- Mothers of children under-five years old admitted to the paediatric ward in 2013-2014 with confirmed malaria (positive blood slide for plasmodium falciparum or RDT)
- Mentally sound mothers of under-five children
- Resident in Thyolo district.
- Mothers who gave consent to take part in the study

The exclusion criteria that will be used are:

- Mother of under-five child who was not a resident of Thyolo district
- Mentally unstable mothers
- Mothers who did not give informed consent to participate in the study

3.4.2 Sampling technique

A non-random or non-probability sampling method was used in this study. It means that all elements in the population have unequal chance of being selected in the sample. This means the sample lacks representativeness (Brink et al 2012:139).

The researcher used convenience (non-probability) sampling method which involves non-random selection of the study elements. Convenience sampling which is also known as haphazard, availability sampling or accidental sampling entails using the most convenient available individuals as study participants. Those that are available and willing to participate are requested to take part in the study. All mothers of under-five children admitted to children’s ward, Thyolo District Hospital, with confirmed malaria diagnosis were requested to voluntarily take part in the study.
It is not generally recommended in quantitative research to use convenience sampling because it may not confer representativeness and most statistical calculations are appropriate for a randomly selected sample (Brink et al 2012:140; Joubert 2007:100-1001; Polit & Beck 2010:291). The sample is likely to be biased in favour of hospital goers.

However, in this study convenient sampling is convenient and economical. According to Burns and Grove (2011:305-306), convenience sample is appropriate when the researcher has no list of individuals (sampling frame) and new concepts are studied. The researcher interviewed the available mothers in the ward of children under-five years old admitted with confirmed malaria.

### 3.4.3 Sample size

A sample size is defined as a subset of the population selected for a study in order to obtain statistically valid conclusions (Burns & Grove 2011:308; Polit & Beck 2010:316). The researcher with advice of a statistician calculated the sample of the study as follows:

\[
N = \text{Expected number of under-five admissions due to malaria (1 Month) to Thyolo District Hospital}
\]

\[
P = \text{Proportion of under-five admissions due to malaria to Thyolo District Hospital (Estimated)}
\]

\[
(1-P) = \text{Proportion of under-five outpatients with malaria at Thyolo District Hospital}
\]

\[
Z_{\alpha/2} = \text{Level of confidence at 95%}
\]

\[
D = \text{Margin error}
\]

\[
n = \text{Required sample size}
\]

\[
N=146
\]

\[
P=0.31
\]

\[
(1-P)= 0.69
\]

\[
Z_{\alpha/2} = 1.96
\]
D = 0.05
\[n = \frac{\left(\frac{Z_{\alpha}}{2}\right)^2 \cdot N \cdot P(1-P)}{D^2(N-1) + \left(\frac{Z_{\alpha}}{2}\right)^2 \cdot P(1-P)}\]
\[n = \frac{(1.96)^2 + 0.31 + 0.69}{0.05^2 + 1.45 + (1.96)^2 + 0.31 + 0.69}\]
\[n = 101.3\]
\[n = 102\]

3.5 DATA COLLECTION

3.5.1 Introduction

According to Burns and Grove (2011:52), data collection refers to “precise, systematic gathering of information relevant to the research purpose or the specific objectives, questions, or hypotheses of a study”. In this survey, a self-developed questionnaire was used as data collection tool.

3.5.2 The questionnaire

According to Joubert (2007:107), a questionnaire is “a list of questions which are answered by the respondent, and which give indirect measures of the variables under investigation”. In other words, a questionnaire is a printed self-report form with questions to elicit data from the respondents. The questionnaire offers the cheapest and reliable route to investigate what people believe, think and know (Polit & Beck 2010:345). Questions can be answered by the respondent on his/her own. This is called self-administered. In cases where respondents cannot read it, questions and possible responses can be read to the respondents by the researcher or an assistant and the responses can then be recorded.

3.5.2.1 Advantages and disadvantages of a questionnaire

A questionnaire as a data collection instrument has advantages and disadvantages. The advantages include the following:
Suitability for illiterate respondents.

Cheap because it requires less time and energy to use.

Promotes anonymity and privacy. The standard format of a questionnaire facilitates the gathering of data from many respondents.

Questions in the questionnaire are likely to be understood by respondents because it is pre-tested.

In cases where interviewers are used validity and reliability are promoted because the researcher is able to obtain consistent and accurate measurements (Joubert 2007:108; Polit & Beck 2010:345; Schmidt & Brown 2012:235).

However, the following are disadvantages of a questionnaire:

- Not all respondents may be able to answer all questions.
- Some questions may be unclear to the respondents and this may result in incorrect answers especially where self-administration is used.
- The researcher may obtain poor response rate.
- The respondent may be influenced by the format of the questionnaire.

The researcher overcame the disadvantages by doing the following:

- Training the two research assistants in order to ensure correct answers.
- Items in the questionnaire were properly arranged and translated into Chichewa, Malawi’s national language to encourage respondents answer all questions.
- Mothers who provided consent were allowed to participate in the study to ensure a good response rate. All respondents completed the questions.
- The instrument was pre-tested.

3.5.2.2 Layout of the questionnaire

The questionnaire of this research was composed of a covering letter and four sections:
Covering letter

In this letter, the researcher welcomed the respondent to the study and introduced the institutions involved in this study. The study purpose was stated and the participants were assured that the research ethics would be observed and respected.

Section 1

In section 1 of the questionnaire the respondents’ economic-demographic information were recorded. This information was used to describe the sample and study population. In addition, the association between economic-demographic data and the respondents’ knowledge, attitudes and practices (data of section 2) could also be examined.

Section 2

Section 2 of the questionnaire assessed the respondents’ knowledge regarding malaria in children under-five years old and it also investigated attitudes and practices (treatment-seeking behaviour).

TABLE 3.1: LAYOUT OF THE QUESTIONNAIRE

<table>
<thead>
<tr>
<th>SECTIONS</th>
<th>QUESTIONS, DESCRIPTIONS AND MOTIVATION</th>
</tr>
</thead>
</table>
| Section 1: Economic-demographic data | Questions 1.1-1.11 sought data about respondents’ age, tribe, marital status, children details, level of school, religion, work and monthly earnings.  

This information helped in describing the study population and respondents and identify relationships between the economic-demographic data and mothers’ knowledge, attitudes and practices on malaria in under-five children |
| Section 2: Knowledge, attitudes and practices | Questions 2.1-2.12. The respondents were asked about the aspects of malaria including knowledge: cause, transmission, risk of malaria, signs and symptoms, home treatment, preventive measures and sources of malaria information as well as treatment-seeking behaviour and factors that affect the use of recommended preventive measures and modern health services. In addition respondents were also asked to say anything that they wished to know about malaria.  

Recognition of these malaria aspects is necessary in handling the children attacked by malaria and reduce malaria-attributable deaths. |
3.5.2.3  Refinement of the questionnaire

The researcher asked the experts in public health and malaria management to make comments on the length, suitability and contents of the questionnaire and to make recommendations. The experts included a statistician, paediatric nurse, clinician and the research supervisor. The researcher then refined the questionnaire based on the suggestions of the experts. These experts did not take part in the execution of this research.

The English version of the questionnaire was translated into Chichewa, Malawi’s national language by two people who had a good working knowledge of the two languages. The two translators compared their Chichewa versions and then translated their commonly agreed version back to English and this version was compared with the original English one. Thereafter, the questionnaire was submitted to the supervisor for approval.

The researcher conducted a pre-test with 20 respondents from the paediatric ward. Polit and Beck (2010:345), define a pre-test as “a trial run to determine whether the instrument is useful in generating desired information”. These respondents were not included in the actual study. The pre-test of the research instrument was carried out in order to find out whether there were any problems in the wording (such as ambiguity of meanings) or limitations in the response of categories of instrument. The comments that were made by the respondents in the pre-test were utilised to finalise and improve the questionnaire.

3.5.2.4  Competency indicator

The experts in the field of study were asked to look at the questionnaire and suggest the correct answers that could be given by the respondents as an indication of mothers’ malaria knowledge. The experts included the research supervisor, a public health nurse and a professional statistician. Mothers who said ‘yes’ to the correct answer and ‘no’ to wrong answers were described as knowledgeable to that questionnaire item.
The opinions of these experts in the standards promoted the validity and reliability of the questionnaire.

3.5.3 Data collection process

Structured data collection approach (pre-tested questionnaire) was used to ensure that all the variables of interest were included (Polit & Beck 2010:343). A structured interview involves collecting research data from study participants by personally interacting with them. The interviewer asks questions (face-to-face interview) containing pre-determined answers to all respondents. This offers a way of research control because the interviewer clarifies items which the research subjects fail to understand (Burns & Grove 2011:350-353). Structured interview increases objectivity of the gathered data because all respondents are asked exactly the same questions. In addition, this approach increases response and questionnaire completion rate through researcher-respondent interaction (Babbie & Mouton 2001:249; Fisher & Foreit 2002:74). A face-to-face interview with a structured questionnaire also helps in reducing administrative costs and difficulties related to low literacy levels of mothers in the district (Burns & Glove 2011:351). However, structured interview may introduce respondent bias into the study (Polit & Beck 2010:345-346).

A total of 102 questionnaires, one questionnaire per respondent, were used to interview mothers of under-five children in the ward. The children’s ward was provided with a sealed box for the collection of completed questionnaires. The face-to-face interview was conducted by two trained interviewers in a private room.

3.6 VALIDITY OF THE MEASURING INSTRUMENT

3.6.1 Introduction

According to Myer and Karim (2007:155), only a valid and reliable research instrument ensures that the phenomenon is measured accurately. Validity of a quantitative instrument refers to the degree to which that instrument measures consistently and accurately what it is intended to measure in the context of the phenomenon of interest. In other words, it is a measure of the truth or accuracy of a claim determined by internal and external validity and by controlling threats to each of these concepts (Burns &
Validity of a research is enhanced by improving face, content, construct, and criterion validity of the measuring instrument.

### 3.6.2 Aspects of measuring instrument validity

#### 3.6.2.1 Face validity

According to Polit and Beck (2010:377), face validity is the subjective appraisal of the research instrument by experts to ascertain its appearance and content. However, content, criterion, and construct aspects of validity surpass face validity in assessing instrument validity though it is necessary (Polit & Beck 2010:377). To ensure face validity of the research questionnaire, the research supervisor, a statistician and public health professionals evaluated it.

#### 3.6.2.2 Content validity

Content validity refers to the adequacy of representation of the variables under study being reflected by the instrument (Burns & Grove 2011: 335; Polit & Beck 2010 377-378; Schmidt & Brown 2012:228-229). It demands an elaborate literature review on the part of the researcher as a crucial step to develop an instrument that incorporates all relevant aspects of the phenomenon under study (Babbie & Mouton 2001:123). In this study the researcher conducted a thorough and comprehensive literature review (Refer to chapter 2) on mothers’ knowledge, attitudes and practices on malaria in under-five children that may be associated with malaria-related mortality in this age group. The researcher’s experience of the Thyolo malaria programme over many years also played a vital role in the development of some of the questionnaire items. In addition, the researcher involved the statistician, public health and malaria experts to scrutinise the questionnaire to ensure its validity.

#### 3.6.2.3 Construct validity

Construct validity examines the fit between the conceptual definitions and the operational definitions of variables (Polit & Beck 2010:379). No constructs were developed and tested in this study.
3.6.2.4 **Criterion validity**

Criterion validity refers to multiple measurements. It is achieved by comparing scores on one measuring instrument with an external criterion, the *gold standard*, that can measure the concepts under study (Joubert 2007:120; Polit & Beck 2010:378; Schmidt & Brown 2012:229-230). In this study, criterion validity will not be applicable because another measure of the concepts is not available. However, over time by using the instrument in multiple studies and refining it, criterion validity could be achieved.

3.6.3 **Measures to ensure internal and external validity**

3.6.3.1 **Internal validity**

Internal validity is the primary objective of experimental methodologies. There will be no variable manipulation in this study, but the following is important:

- **Reduction of bias**

  Bias is any influence or action in a study that distorts the findings or slants them away from the true or expected outcome (Burns & Grove 2011:254; Polit & Beck 2010:107). The data collection instrument was translated into Malawi’s national language, Chichewa, to reduce bias. In addition, the researcher adhered to principles of scientific integrity throughout this study.

- **Selection bias**

  This bias could occur during the selection of study site. The site was relevant for this study and mothers were chosen because the rural population in Malawi is generally poor, less educated and prone to malaria attacks, with inadequate social infrastructure. Rural children are prone to malaria and mothers play a vital role in the management of sick children. The researcher’s work experience in the district supports this assumption (Joubert 2007:160-161; Schmidt & Brown 2012:150).
3.6.3.2 External validity

Schmidt and Brown (2012:153), define external validity (generalisability) as the extent to which the results of a study can be generalised to the population from which the sample was drawn. These findings cannot be generalised because of non-probability sampling. The statistician’s advice on sample size was of benefit in this regard. The use of inferential statistics to analyse the findings and compare them with previous studies in the literature, would justify cautious generalisability of the findings of this study to mothers of under-five children suffering from malaria in Thyolo District.

3.6.4 Validity of the data collection process

All respondents were encouraged to feel free and exercise honesty. The interviews took place in a friendly environment, a separate room in the children’s ward. The use of face-to-face interview significantly reduced the number of incomplete questionnaires. Completed questionnaires were sealed in envelopes and kept in the provided sealed box to ensure anonymity of the institution and the respondents.

3.7 RELIABILITY OF THE MEASURING INSTRUMENT

Reliability of a data collection instrument refers to its repeatability, consistency, accuracy or precision (Burns & Grove 2009:377; Joubert 2007:155; Polit & Beck 2010:373). A reliable instrument enhances the power of detecting existing variable relationships. In research, lack of reliability commonly result when the respondents fail to understand the question, are asked about something they do not clearly recall, or asked about something of little relevance to them. The use of face-to-face interview and structured questionnaire are some of the methods to improve reliability in the study. Three attributes which are used to summarise reliability of the measuring instrument include stability, internal consistency and equivalence. These attributes are discussed below.

3.7.1 Stability

The instrument will be considered reliable by showing stability, by producing the same results with repeated testing, and homogenous as it measures the same concepts and
characteristics (Schmidt & Brown 2012:232). A test-retest procedure is used to examine the stability of the measuring instrument (Joubert 2007:159; Polit & Beck 2010:373-375). The use of this test was not possible in this study because the researcher used convenience sampling technique and the names of respondents were not available. Furthermore, applying test-retest to examine reliability of knowledge could give unreliable outcome. This is because after the first test the mothers would be motivated to acquire malaria knowledge. The results of the re-test, therefore, would be unreliable.

3.7.2 Internal consistency

Internal consistency reliability is the degree to which the measuring instrument measures the same characteristics or concepts (Burns & Grove 2011:334; Polit & Beck 2010:375; Schmidt & Brown 2012:232). Dividing the test items into two separate groups and assess the differences of the scores is one of the methods to estimate internal consistency reliability. However, Cronbach’s alpha is the most common way that is used to estimate internal consistency reliability. It examines the correlation of the items of the test with one another. In this study Cronbach’s alpha coefficient was not calculated because opinions of the expert regarding competency indicator, the use of face-to-face interviews and a structured questionnaire promoted reliability (Joubert 2007:108; Polit & Beck 2010:345).

3.7.3 Equivalence

Reliability of a research instrument can also be estimated by calculating the equivalence, that is, the alternative forms of an instrument should be in agreement.

This approach is suitable for assessing the reliability of a structured observation instrument (Burns & Grove 2011:333; Polit & Beck 2010:375). In this research, equivalence was not used because the alternative instrument was not available.

3.8 DATA ANALYSIS

Data analysis refers to the reduction, organisation and interpretation of data using various descriptive and inferential statistical methods (Burns & Grove 2011:52; Polit &
The statistician was consulted to assist in data analysis of this research.

The researcher checked the data for errors that are often included during the process of entering data into the required form (Joubert 2007:107). The collected data were keyed in using Census and Survey Processing (CSPro) software. CSPro is a software package for data entry, editing, tabulation and dissemination of census and survey data. The software is widely used due to its in-built features for first key-in and verification (double entry) modes. In addition, the software has features for field control checks. This is important for consistency and validation checks. Upon data verification in CSPro, the data were directly exported to Statistical Package for the Social Sciences (SPSS) version 16.0 for data cleaning and analysis. The analysis consisted of both descriptive and analytic statistics.

3.8.1 Descriptive statistics

Descriptive statistics were performed in the study to summarise the demographic characteristics of mothers and their under-five children. The results were presented using frequency and percentage tables/graphs. Data on knowledge, practices regarding malaria in under-five children were presented using graphs.

3.8.2 Analytic statistics

Analytic (inferential) statistics enable researchers to draw conclusions about a study population using sample data (Burns & Grove 2011:378; Polit & Beck 2010:405). The researcher and the statistician performed standard $x^2$ test to determine if socio-cultural and demographic factors affect mother’s knowledge on malaria in under-five children at 95% confidence level.

3.9 ETHICAL CONSIDERATIONS

Research ethics involves protecting the rights of the participants and the institutions in which the research is conducted, and maintaining scientific integrity (Babbie & Mouton 2001:531; Burns & Grove 2009:61). Ethics is concerned with the human judgement as to what is right and what is wrong (Stommel & Wills 2004:373). Research ethics was
part of this study from the beginning to the end. The Belmont Report contains three ethical principles which constitute the expected requirements for research. These include beneficence, respect for human dignity and justice (Joubert 2007:31; Polit & Beck 2010:121). These principles are discussed in the following paragraphs.

3.9.1 Beneficence

The principle of beneficence reminds the researchers to minimise risks and maximise benefits for the research subjects as well as the community (Polit & Beck 2010:121). Research can potentially cause social, psychological, emotional and economical harm and discomfort to the participants (Burns & Grove 2009:190). The participants for this study were not subjected to any harm because the data collection procedure did not involve any intervention and the structured interviews were conducted in a private room in children’s ward. The respondents did not financially contribute to this study or no financial burdens like travel money was required. Physical risks like headache and fatigue were avoided by interviewing the respondents for not more than 30 minutes.

The aim of the research was explained in detail. The mothers were assured that the divulged information would not be used against them and their children or compromise the treatment and care in the hospital. The study findings will be useful for containing the problems experienced by the district in managing under-five children with malaria. It is for this reason that the health facility was provided with a copy of the study report for health care providers to understand mothers’ knowledge, attitudes and practices towards febrile under-five children.

3.9.2 Respect for human dignity

This includes the right of self-determination and the right of the participants to full disclosure of the facts of the study (Burns & Grove 2009:189; Polit & Beck 2010:122). Self-determination is concerned with the right of the subjects to decide to participate in the study or not without suffering the consequences of their decision. Mentally unsound mothers were excluded from this study to ensure protection of dignity and voluntary participation because they cannot make their own decision to participate in the study.
Full disclosure implies that the study has been described in detail by the researcher. The description should include the anticipated harms and benefits of the investigation. In addition, the participants should be informed about the right to quit the study at anytime without explanation or justification. In this study the researcher ensured that the involved institutions and mothers understood the study and allowed it to be conducted or not (Polit & Beck 2010:123). The mothers voluntarily shared their personal information after informed consent was given. Mothers gave study consent in oral and written form because of the low literacy rate in the district. In addition, illiterate respondents thumb printed their approval on the consent forms. The consent form contained the following details: study purpose, aim, objectives, the procedure that will be followed, any potential harm, if any and the benefits. The telephone numbers, postal and e-mails addresses of the researcher were included in the letter for easy communication. A participant’s consent form is attached as Annexure D.

The researcher also addressed the institutional ethical concerns in this study. The institutions which were involved in this study are the University of South Africa (UNISA) and the Ministry of Health (MoH) of Malawi. The researcher obtained written permission to conduct the study from the research committees of the UNISA (see Annexure C), Thyolo District Hospital and the MoH’s National Health Sciences Research Commitee (NHSRC), attached as Annexure B. The Ethics Committee of the faculty of Human Sciences at the UNISA scrutinised the researcher’s research proposal to safeguard the ethical rights of the study subjects and the institutions. The same scrutiny was done by the MoH research committee in Malawi. The data collection had to wait for these procedures to be completed. Furthermore, Thyolo district hospital and other stakeholders were given a copy of the study results and, efforts were made by the researcher to inform the institutions before publishing the research findings.

As the study aimed to investigate mothers’ knowledge, attitudes and practices regarding malaria that could possibly be improved, the investigator was of the view that it served the best interest of the children, mothers, and the institutions. It therefore did not contradict the Declaration of Helsinki (Burns & Grove 2011:105).
3.9.3  Principle of justice

Principle of justice ensures that the research subjects enjoy the right to fair treatment and the information they provide for the study remains completely private (Joubert 2007:33; Polit & Beck 2010:124).

3.9.3.1 The right for fair selection

The researchers are required to select participants in a fair manner, that is, social, cultural, racial, political and religious differences should not affect the sample selection (Burns & Grove 2011:118). In this research the respondents were selected by means of convenient sampling method in the ward. There were no financial benefits for the respondents. However, they were informed that this study would benefit the children and the society as a whole. Further, the researcher informed the mothers that this research was for educational purposes and funded by the researcher himself.

3.9.3.2 The right to privacy

According to Polit and Beck (2010:125); Burns and Grove (2011:114-115), right to privacy involves the right to share personal information. The researcher respected this right by collecting data from only the consented mothers in a private room in children’s ward. Furthermore, the completed questionnaires were kept in a sealed box that was made available in the children’s ward to ensure privacy of the collected data.

3.9.3.3 Anonymity and confidentiality

Anonymity and confidentiality were observed throughout this research. Anonymity is keeping secretly the identity of the study subjects (Burns & Grove 2011:117; Polit & Beck 2010:129). Code names will be used instead of mothers’ real names during data collection and analysis. In this study, anonymity was not be compromised by keeping the completed questionnaires in a sealed box in the ward until the researcher collected them. However, anonymity could be compromised because data collectors might personally know some of the respondents. The researcher overcame this by emphasising anonymity during training of the data collectors.
Confidentiality, on the other hand, refers to keeping secretly the collected data, names of respondents and involved institutions (Burns & Grove 2011:117; Polit & Beck 2010:130). The questionnaires were kept in a sealed box soon after the interviews. The use of code numbers instead of names of the respondents on the questionnaires avoided linking any person or institution to the collected data.

3.9.4 Scientific honesty and integrity

Scientific dishonesty entails fabrication, or falsification of the study findings, plagiarism and manipulation of results for the researchers’ benefit. Research work demands honesty and integrity (Burns & Grove 2011:364). The researcher ensured scientific honesty and integrity in this study. Data were collected by the researcher and two data collectors. The data were scrutinised by the research supervisor. The raw data were not manipulated or fabricated and the analysis was done by an independent and professional statistician. Furthermore, all the text, ideas, and data that were acquired from other sources and researchers for this study conformed to the rules as stipulated by the international copyright laws. All sources of information were acknowledged in the bibliography to ensure that there was no plagiarism in this research.

3.10 SCOPE AND LIMITATIONS OF THE STUDY

The researcher would like to point out the following anticipated limitations of this study.

Thyolo District Hospital was the only institution where the study will take place. It would therefore be a problem to generalise the findings of this investigation to other districts of Malawi. It was context-specific to the culture and environment of the Thyolo District.

This study was limited to mothers of children under the age of five years. Knowledge, attitudes and practices that may contribute to malaria-related mortality for other age groups were not foci of this study.

This was a descriptive cross-sectional study. The data were collected at one particular point in time. It was an investigation of the associations rather than the causality observed between dependent and independent variables. Mothers’ knowledge, attitudes and practices regarding malaria in children under the age of five years are subject to
change over time. There is therefore a need to repeat studies over time. A prospective study would have been more appropriate research design because it could be possible to measure the outcome of the mothers’ knowledge, attitudes and practices regarding malaria in under-five year old children (Brink et al 2012:102). The problem is that the researcher faced time and budget constraints. The researcher funded the study himself using no funding from outside. However, it could be argued that cross-sectional study provided a rare opportunity to unearth the mothers’ knowledge, attitudes and practices (treatment-seeking behaviours) regarding malaria in under-five children as well as the associated factors. The study could be repeated and compared.

The study was carried out at a state health facility in Thyolo district. Private clinics were not involved. The responses that were expressed by respondents in the study might not be similar to those attending private institutions.

Cautious generalisation was required due to the contextual research setting and convenient (non-probability) sample. However, the mothers in this study were representative of Thyolo hospital attendees with regards to the characteristics (demographics) that were examined in this research. A limitation might also surface from the fact that a data collection tool was developed by this novice researcher. There could be possible unnoticed biases in the tool.

3.11 CONCLUSION

This chapter has described the research design and methodology that the researcher used in this study. The researcher used this chapter to discuss the research design, study population, sampling, the data collection process, the research instrument and its validity and reliability, data analysis, the ethical considerations, and limitations of the study.

The overall research objective was to describe mothers’ knowledge, attitudes, and practices (treatment-seeking behaviours) that might play a role in malaria-attributable mortality in under-five children at the health facility level. The researcher made recommendations based on the findings of this study that may contribute to the reduction of malaria-attributed under-five deaths in the Thyolo district. With assistance of a statistician, the researcher analysed the data and the results were discussed in chapter 4.
CHAPTER 4

DATA ANALYSIS AND DESCRIPTION OF RESEARCH FINDINGS

4.1 INTRODUCTION

In this chapter the data analysis and description of research findings are presented. Data collection commenced in December, 2013 and ended in February, 2014. This was done on all the days that participants were available. The completed questionnaires were numbered. The researcher together with a professional statistician analysed and interpreted the research findings. Data entry, cleaning and analysis was done by Census and Survey Processing (CS-Pro) and SPSS version 16.0. Descriptive statistics was used to analyse some of the variables, while inferential statistical methods were applied to analyse associations between some of the research variables. Data is presented using percentages, p-values and chi-square tests. Percentages are rounded off to one place after the decimal point and therefore totals might sometimes be just more or less than 100%. Graphs are also used. Where the chi-square test was applied, it is reported in chapter 5. The researcher qualitatively analysed open-ended questions and non-numerical responses.

4.2 PARTICIPATION RATE

The sampling method used in this study was convenient sampling. All participants were provided with all the information about the study and they had to sign informed consent before participating in the study. A total of 102 mothers of children under-five years old were requested to take part in the study and all accepted (giving a 100% participation rate). The questionnaires were completed by the researcher or any of two research assistants during a structured interview using the questionnaire. The 100% response rate is unusual but can be ascribed to the following reasons:

- The purpose of the study was explained very well to every potential participant.
- The potential participants realised that the study was not threatening or harmful because data collection did not involve any intervention.
• The respondents understood that the findings of the study could eventually help the health workers reduce malaria-related under-five deaths in the district.
• The research assistants were not strangers in the hospital because they were working as an enrolled nurse and a data clerk respectively at the same hospital.
• Thorough training of the research assistants contributed to them acting in a professional way.

4.3 RESEARCH RESULTS

Where possible, literature and other Malawian national demographic data were used to contextualise the findings of this research. All the results with their possible explanations are presented.

All responses to questions that were used to collect the research data are identified by their question numbers as they appeared in the data collection tool. The respondents’ responses are reflected in the data presentation sections in this chapter.

4.4 THE RESPONDENTS’ ECONOMIC-DEMOGRAPHIC CHARACTERISTICS

Economic-demographic variables could influence the mothers’ knowledge, attitudes and practices regarding malaria in children under-five years old. Respondents’ demographic factors in this study included:

• Age
• Tribe
• Marital status
• Educational level
• Religious affiliation
• Employment status
• Economical status
• Number of live and dead children
The study also included the following demographic characteristics of the children:

- Child’s age
- Gender

4.4.1 Respondents’ age (Question 1.1)

Question 1.1 of the questionnaire enquired about the age category of the participants. The respondents’ ages were grouped into five class intervals namely: 19 years and below, 20-29, 30-39, 40-49, and 50 years and above. The researcher wanted to determine if mothers’ knowledge regarding malaria were influenced by age and if there was an age category that was more knowledgeable than the rest.

The data showed that the majority of the respondents 57.8% (n=59) were in the age category of 20-29 years and 11.8% (n=12) were 19 years and below. All respondents were below the age of 50 years. It was not surprising that some respondents were teenagers (19 years and below) because teenage pregnancies is a problem in Malawi (NSO & ICF Macro 2011:49). It is a concern because it is associated with high morbidity and mortality for both the mother and the child. About 65% of Malawian women become mothers by the age of 20. One in every four teenagers (26%) of the age 15-19 begins childbearing. Furthermore, 20% of teenagers aged 15-19 have had a live birth. The data
also indicates that 6% of all the teenagers in the country are pregnant with their first baby (NSO & ICF Macro 2011:49-50). The percentage of teenage mothers in this study.

4.4.2 The tribes of respondents (Question 1.2)

Question 1.2 was set to identify to which tribes the respondents belong. The composition of the sample regarding tribes is reflected in the figure 4.2 below:

![Figure 4.2 Tribes of the respondents (n=102)](image)

The majority, namely 75% (n=77) belongs to the Lhomwe tribe. This tribe is actually the majority in the Thyolo district. Other respondents identified themselves as Yao 4% (n=4), Chewa 6% (n=6), Ngoni 4% (n=4), Tumbuka 2% (n=2), Sena 4% (n=4) and “other” 5% (n=5). Five respondents reported that they belonged to the Mang’anja tribe and they were in the category of the “other” tribe.

4.4.3 Respondents’ marital status (Question 1.3)

Question 1.3 of the questionnaire sought the marital status of the respondents. Categories of marital status were grouped as never married, married, divorced, separated, widowed and co-habiting. Figure 4.3 summarises the marital status of the respondents.
As shown in the figure above, the majority of respondents, namely 78% (n=80) were married, fewer than 3% were never married, 10% (n=10) were divorced while 2% (n=2) were separated, 6% (n=6) were widowed and 1% (n=1) co-habited.

This percentage is above the Malawian national data which indicates that 59% of women age 15-49 in Malawi are married. 9% of Malawian women age 15-49 are co-habiting as compared to 1% in this study. The percentage of never married women stands at 20% as compared to 3% in this study. Divorce, separation, and widowhood combined are at 13% in women age 15-49 which is higher than 9% in this study. About 20% of teenagers (15-19) is in a formal marital relationship compared to 41.7% in this study (NSO & ICF Macro 2011:74). It could be that people of the Lhomwe tribe have custom to marry rather than to remain unmarried.

4.4.4 Respondents’ education level (Question 1.4)

The respondents’ level of education was determined by question 1.4 of the questionnaire. The following are categories of education level that were used in this study: never attended school, not completed primary school, completed primary school, not completed secondary school, completed primary school, not completed college/university, and completed college/university.
The level of education of the respondents varied from never attended school to completed college/university. As depicted in the figure above, 17.6% (n=18) of the respondents never attended school, while fewer than 3.9% (n=4) had at least a college/university qualification. In Malawi, people stay in primary school for eight years and at the end they sit for examinations and are awarded a primary school leaving certificate of education (PSLCE). People who fail to complete primary school are regarded as uneducated in this country. Half of the respondents in this survey 50% (n=51), that is those that never attended school plus those that failed to complete primary school, fall into the uneducated category because they did not have a primary school qualification.

Although free primary education was introduced in Malawi in 1994, 70% of the children do not complete primary education (MoH 2011:17). About 19% of females in Malawi have never attended school as compared to 17.6% in this study (NSO & ICF Macro 2011:11-12).

According to NSO & ICF Macro (2011:284) education attainment of women age 15-49 in the Thyolo district is as follows: no education (12.6%) which is lower than 17.6% in this study, some primary education (60.4%) which is higher than 32.4% in this study, completed primary school (9.5%) which is lower than 16.7% in this study, some
secondary education (11.4%) which is higher than 10.8% in this survey, completed secondary school (5.3%) as compared to 16.7% in this study, more than secondary school (0.9%) as compared to 5.9% in this study.

4.4.5 Respondents’ religion (Question 1.5)

In question 1.5, respondents were asked to mention their religion namely Islam, Christianity, none and other religions. In the case of Christianity, denominations were included like Roman Catholic, Anglican, Adventist, Church of Central Africa Presbyterian (CCAP), and other Christian churches.

![Figure 4.5 Respondents’ religious affiliations (n=102)](image)

The majority of the respondents, namely 94% (n=96) were Christians. Of the Christian churches the Seventh Day Adventist (SDA) was leading with 30% (n=30). This is not surprising because the SDA church has its headquarters in the Thyolo district. Malawi, the Thyolo district in particular, is predominantly Christian. Most respondents belonged to other Christian denominations namely Catholic 23% (n=24), Anglican 3% (n=3), CCAP 14% (n=14) and other Christian churches 24% (n=24). Only 3% (n=3) of the respondents were Muslims, 1% (n=1) had no religion and 2% (n=2) were members of other religions apart from Christianity and Islam.
Other Christian churches that were patronised by some of the respondents include:

- Lutheran 3% (n=3)
- Topia 4% (n=4)
- Assemblies of God 3% (n=3)
- African Evangelical 3% (n=3)
- Miracle 2% (n=2)
- Glory of God 2% (n=2)
- Chiyanjano Africa 1% (n=1)
- Chikondano 1% (n=1)
- United Assemblies 1% (n=1)
- New Jerusalem 1% (n=1)
- Living waters 1% (n=1)
- Come to Jesus 3% (n=3)
- Church of Christ 4% (n=4)
- Baptist 2% (n=2)
- Jehova Witness 2% (n=2)
- New Life 1% (n=1)

The population of Malawi is comprised of 83% Christians compared to 94% in this study and 13% Muslims or Islam which is higher than the 3% in this study as well as 2% of other religions and 2% of no religion (MoH 2011:16).

4.4.6 Respondents’ employment status (Question 1.6)

This question was set to determine the employment status of the respondents which is the source of income. For purposes of data analysis, categories of work status were grouped into six groups, namely government employee, non-government employee, unemployed, self-employed, student and retired.
The employment status of the respondents is indicated in the figure 4.6 above. The results gave a picture of high level of unemployment among women in the district. Of 102 respondents 81% (n=83) were not employed while 19% (n=19) were employed. None of the respondents was a student nor retired worker.

Malawian national data indicates that fifty-six percent (56%) of women of all age groups are employed and 70% of women with more than a secondary education are more likely to be employed than their counterparts (NSO & ICF Macro 2011:32-33). The majority of respondents in this research were unemployed probably because they did not have academic qualifications. In Malawi, about 60.6% of women age 15-49 are employed as compared to 19% in this study.
Of the employed respondents, 52.6% (n=10) were employed by employers other than government, 31.6% (n=6) were employed by government, and 15.8% (n=3) were self-employed.

National statistics indicate that 10% of women between the ages of 15 to 49 in the Thyolo district are employed by government, 16.3% by non-family members and 73.7% are self-employed mostly in agricultural-based businesses (NSO ICF & Macro 2001:296). Malawi is predominantly an agricultural country and 85% of the population depends on agriculture (MoH 2011:17). According to NSO & ICF Macro (2011:290-291), only 0.9% of occupations in the Thyolo district for women are professional or technical in nature, 1.1% is clerical work, sales and services account for 24.2% and 5.4% for skilled manual. Unskilled manual work is done by 5.5%, domestic service accounts for 1.7% and agriculture are practiced by the most, namely 61.2%.

**4.4.7 Respondents’ income (Question 1.7)**

This question determined the average amount of money that the household earned per month in Malawi kwacha. The majority of the households’ earnings were very little reflecting the finding that 81% (n=83) of the respondents were unemployed (see figure 4.8).
Figure 4.8 presents the amount of money earned by respondents per month. About half 46.1% (n=47) of the respondents earned k0-k9999 equivalent to US$23 per month at the current exchange rate. The minimum wage as per law in Malawi is k15000 (US$36). This means that 56.9% (n=58) of the respondents earned less than the minimum wage determined for Malawian employees. Furthermore, 14.7% (n=15) of the respondents earned k15 000-k19 999, 8.8% (n=9) earned k20 000 to K24 999, 4.9% (n=5) earned k30 000-k34 999 and 14.7% (n=15) earned k35 000 and more. Most women in the district are in poorly paying occupations (NSO & ICF Macro 2011:290)

4.4.8 Respondents’ type of houses (Question 1.8)

Question 1.8 was included in the questionnaire to solicit information on type of houses the respondents were coming from as an indicator of socio-economic status. Type of houses were categorised into the following: poles and grass, unburnt bricks, bricks and mud, burnt bricks and cement, and other.
Of all the respondents 41% (n=42) came from houses constructed with unburnt bricks, 28% (n=29) had houses made from bricks and mud, 3% (n=3) used houses made from poles and bricks and 28% (n=29) came from houses in the category of burnt bricks and cement. Overall the data showed that 72% (n=73) of the respondents lived in temporary houses (houses made from unburnt bricks, poles and grass, and bricks and mud) and only 28% (n=29) had permanent houses (houses made from burnt bricks and cement).

The respondents’ types of houses are in tandem with their monthly earnings and employment status. Most of them could not afford a decent permanent house. National data indicates that over 39% of Malawians live below the poverty line. According to the MoH (2011:17) about 43% of Malawians in rural areas like the Thyolo district live below the poverty line compared to their urban counterparts which is lower than the finding in this study (46.1% of the respondents earned US$23 per month).

### 4.4.9 Respondents’ number of children (Question 1.9)

Question 1.9 was an open-ended question set to find out respondents’ number of children. Mothers’ number of children could have an effect on the treatment-seeking behaviour (Jombo et al (2011:10-14)). The researcher wanted to determine whether mothers with more than one child were likely to have better malaria knowledge and seek treatment promptly at a health facility because of malaria experience gained over the years of taking care of more children as compared with mothers with one child.
Figure 4.10 Respondents’ number of children (n=102)

About a quarter of the respondents, namely 24.5% (n=25) indicated that they had two children, 23.5% (n=24) had one child, 22.6% (n=23) had three children, 20.6% (n=21) had 4 children, 3.9% (n=4) had five children, 2.9% (n=3) had 6 children, one had seven children and one respondent had eight children. On average they had 2.75 children (approximately 3 children) with a range of one to eight and standard deviation of 1.4.

National data indicates that the highest fertility rate (269/1000) is found in women age 20-24 (NSO & ICF Macro 2011:49). This study did not specifically collect fertility data of this age group.

4.4.10 Respondents’ number of deceased children (Question 1.10)

Only 15.7% (n=16) of the respondents had lost a child or more by the time of the interviews. On average the respondents lost 1 child and out of the 16 children seven died of malaria—that is a percentage of 43.8. The respondents were not asked the age at which the children died.

Thyolo district child health data shows that neonatal mortality (meaning death within the first month of life) is 37/1000, infant mortality (meaning death before the first birthday) is 77/1000, child mortality (meaning probability of dying between the first and fifth birthdays) is 48/1000 and under-five mortality (meaning death of a child between birth and the fifth birthday is 122/1000 (NSO & ICF Macro 2011:95, 329).
4.4.11 Information about the admitted children (Question 1.11)

This part of section 1 of the questionnaire consisted of items which were related to the child who was admitted to the hospital during the time of the interviews. They include Age, gender, admission date, reason for admission and duration of illness before hospitalisation.

4.4.11.1 Age of admitted children (Question 1.11.1)

Age of admitted children is presented in the figure 4.11 below.

![Figure 4.11 Age of the admitted children (n=102)](image)

The age distribution of the children was from less than 12 months 6% (n=6), to 59 months 19% (n=19). The majority of the children 34% (n=35) who were admitted to the hospital and treated for malaria during the interview period were in the age group 24-35 months. The minimum age of the children was 6 months and the maximum age was 59 months.
4.4.11.2 Gender of the admitted children (Question 1.11.2)

![Figure 4.12 Gender of admitted children (n=102)](image)

Figure 4.12 shows that more male children 56% (n=57) were included in the sample than female children 44% (n=45). The population of Malawi is composed of 16.8% and 16.9% male and female children under the age of five years old respectively (NSO 2012:10). The researcher could not conclude that prevalence of malaria was higher in male under-five children than their female counterparts.

4.4.12 Reasons for admission to the hospital (Question 1.11.4)

The respondents were asked the reason for the children’s admission to the hospital. This question was set to determine respondents’ understanding of their stay in the hospital and the information they got, if any, about the children’s illness from the health workers. Responses to this question are reflected in figure 4.13.
The majority of respondents namely 81% (n=83) mentioned that the children were admitted to the hospital for malaria treatment, 8% (n=8) mentioned convulsions as the reason for admission, 7% (n=7) said that the children were admitted because they developed a high body temperature (fever), while 4% (n=4) did not mention malaria/fever as the reason for admission to the hospital. Overall 19% (n=19) of the respondents were not specifically aware that their children were admitted to Thyolo district hospital for malaria treatment. This indicates that some mothers do not know the medical diagnosis of their children in the hospital probably due to a lack of proper health worker-patient communication.

4.5 MOTHERS’ ATTITUDES, AND PRACTICES REGARDING MALARIA IN CHILDREN UNDER-FIVE YEARS OLD

4.5.1 Duration of illness before hospitalisation

The last question under item 1.11 was about the duration of illness before the child was admitted to the hospital.

This question aimed at establishing whether mothers promptly sought malaria treatment for children under-five years old or not.
Of the respondents, 51% (n=52) sought malaria treatment at a health facility within 24 hours following the onset of illness as recommended by the Ministry of Health. Malaria case management, including the identification, diagnosis, and prompt treatment of malaria cases with appropriate and effective anti-malarial drugs is one of the major strategic areas for malaria control in Malawi. All malaria cases should be prescribed an appropriate drug within the first 24 hours (Wilson et al 2012:220). The data in this research also revealed that 36% (n=37) of the respondents visited the hospital within 48 hours, 8% (n=8) within 72 hours, while 5% (n=5) got anti-malarial drugs more than 72 hours after the onset of fever.

Only 28% of children under-five years old in Malawi take anti-malarial drugs within 24 hours or 48 hours following the onset of fever. This is not associated to mothers’ educational status, religious affiliations, or wealth quartiles (NSO & ICF Macro 2011:161). According to NSO & ICF Macro (2011:364), in the Thyolo district, 28,5% of children under-five years old with fever take anti-malarial drugs within 24 to 48 hours. This is lower than 87% (n=87) of children under-five years old who took anti-malarial treatment within 24 to 48 hours in this study which was done in 2014 – that is 3 years after the mentioned report.
4.5.2 Respondents’ home-based treatment of malaria in children under-five years old (Question 1.12)

This item in the interview schedule asked the respondents if they administered any type of medications to children at home. Figure 4.15 below shows the number of respondents who administered medications to children prior to hospitalisation.

![Figure 4.15](image_url)

**Figure 4.15  Respondents who administered medication before hospitalisation (n=102)**

Figure 4.15 shows that of all the respondents, 55% (n=56) administered medications at home before the children were admitted to hospital, while 45% (n=46) reported that they did not use any medications at home prior to hospitalisation.

National data on fever management indicates that two in three children with fever seek treatment at a health facility. Only 31% of children living in rural areas in Malawi receive fever treatment from a health facility or health provider (NSO & ICF Macro 2011:124). This is lower than the finding in this study (55%).

4.5.2.1 Medications administered by the respondents before hospitalisation (n=56)

This questionnaire item was for those 56 respondents who admitted that they administered medications to children at home before hospitalisation. It was set to obtain
type of medications that were administered. Figure 4.16 below presents the drugs that were administered to children at home prior to health provider consultations.

Figure 4.16  Drugs administered by the respondents before hospitalisation (n=56)

Of the 56 respondents who administered medications to the children at home, the majority namely 59% (n=33) administered paracetamol (panadol), 14% (n=8) gave the children ACT, 13% (n=7) administered aspirin (acetylsalicylic acid), 11% (n=6) used cafemol, and 4% (n=2) administered quinine. None of the respondents administered doxycycline at home probably because it is not well publicised that it has an anti-malarial effect. Traditional medicine was used by one respondent and one respondent consulted religious healers. Other medications that respondents administered to children before hospitalisation include penicillin, cotrimoxazole (bacterim), and brufen. One respondent could not remember the name of the drug that she administered to her child at home.

The findings revealed that mothers administered anti-malarial drugs, antibiotics, anti-pyretics and on-the-counter pain killers (cafemol) to children. The survey did not ask the dosages that were given to the children. It could not be determined whether these children got the correct dosage of the drugs.

These findings are similar to study findings by a number of researchers. Bbosa (2011:52) conducted a study in Uganda to investigate home-based management of
fever in children under-five years old. The researcher reported that the commonly used anti-fever drugs are panado and aspirin (43,4%), and local herbs (13%).

Yadav (2010:235) in a study in rural part of the desert in Rajasthan, India reported that more than 93,3% of mothers started treating febrile children at home for about 72 hours and then visited the nearest health facility if there was no improvement.

A community-based study was carried out in Adami Tulu district, south-central Ethiopia by Deressa and Ali (2009:1-7) to investigate the local perceptions, practices and treatment-seeking behaviour for malaria among women with under-five children. The study showed that about 3,7% used herbal remedies (garlic, ginger and local leaves), and very few 0,3% reported the use of religious healing such as holy water and traditional medicine. Less than 1% of the mothers did not know the treatment of malaria.

In contrast to the findings in this study, a study in Papua New Guinea about seeking treatment for symptomatic malaria, revealed that home treatment were less likely to be used. Drugs from street vendors and shops like cafemol were rarely used for treatment of malaria (Davy et al 2010:1-9).

4.5.3 Use of insecticide treated mosquito bed nets (Question1.13)

In response to the question “did the child sleep under an insecticide treated mosquito bed net before admission to hospital?”, the majority, namely 62% (n=63) indicated that the children slept under ITNs at home before admission to hospital, while 38% (n=39) never used an ITN.
The ownership and use of either treated or untreated mosquito bed nets is the recommended primary prevention strategy for reducing malaria transmission in Malawi. National data shows that 47% of under-five children sleep under an ITN which is lower than the finding in this study; 39% sleeps under ITN and 28% sleep under long lasting insecticide treated nets (LLIN). In rural areas only 45% of under-five children sleep under a mosquito net (NSO & Macro 2011:26). In the Thyolo district, 67.9% of the households possess at least one net, 42.5% of children under-five years old sleep under a mosquito net (treated or untreated), 36.7% sleep under ITN which is lower than the finding in this study 62%, and 29.4% sleep under LLIN (NSO & Macro:359).

The difference in the rate of mosquito net use may be due to the seasonal nature of malaria transmission, net ownership, and the timing of data collection for the survey. The field work for this survey was conducted during December and February, the peak period of malaria transmission in Malawi. Currently, many households in Africa, and Malawi in particular, own mosquito bed nets because of large donations of free nets from companies and organisations that support the fight against malaria (Graves, Ngondi, Hwang, Getachew, Gebre, Mosher, Patterson, Shargie, Tadesse, Wolkon, Reithinger, Emerson & Richards 2011:1).
4.5.3.1 Consistent use of ITNs

All respondents (n=63) who agreed that they used mosquito bed nets were further asked about the consistent use of ITNs by the children as a follow-up item to question (1.13). The respondents had to choose either “always” or “not all the time, but sometimes”. Figure 4.18 below presents the responses of the respondents.

![Figure 4.18 Consistent use of ITNs by under-five children (n=63)](image)

The figure shows that out of 63 children who slept under INTs, 52% (n=33) of them always slept under the net while 48% (n=30) did not use the net all the time.

4.5.3.2 Respondents’ reasons why the children did not sleep under ITNs before hospitalisation

This was another follow-up item to question (1.13). The researcher used this item to determine reasons why some children never used ITNs at home. The respondents were asked to choose reasons from the list which included foul smell, unavailability, cost, fear of side effects and because it made them feel hot. They were also allowed to mention other reasons. The responses are reflected in figure 4:19.
Figure 4.19 Respondents’ reasons why children did not sleep under ITNs before hospitalisation (n=39)

With regard to reasons for not sleeping under ITNs, 67% (n=26) of the respondents mentioned unavailability of the nets, 10% (n=4) reported that the nets produced foul smell, 8% (n=3) could not afford to buy the nets, while 5% (n=2) said that it was too hot to sleep under the net.

Other reasons mentioned by 10% (n=4) of the respondents for not using ITNs were as follows:

- The mosquito nets had too many holes to be used
- The mosquito net was not used deliberately

ITN ownership is an essential/prerequisite for net use. However, whether mothers will use a net every night, some nights, or not at all may largely depend on different perceptions of the mother and the quality of the ITN.

Githinji et al (2010:1-3) conducted a study in rural area of western Kenya on mosquito net ownership, use and quality and found that some people owned but never used the ITNs although they were regarded as one of the most effective interventions to prevent malaria. They found that 15% of the nets were not used and of those 37% had not even been opened from the manufacturers’ original packet. In 63% of the cases of the
unopened nets were received free of charge. Children also slept under poor quality ITNs with holes and therefore required treatment.

Bbosa (2011:54), in a study on caregivers’ home management of fever in Uganda reported that parents fail to buy mosquito nets because of the high cost. This is similar to the findings of this research.

Ouathara et al (2011:6) assessed malaria knowledge and LLIN use in a rural community of central Cote d’voire. The researchers noted that people did not like to use the nets because they were associated with heat, suffocation and a bad smell which are similar to the findings of this study.

4.5.4 Respondents’ interventions (apart from ITNs) to prevent malaria at home (Question 1.14)

The question, “did you do anything in your house (other than using a net) to prevent malaria before the child was admitted to hospital?”, was asked to determine alternatives to ITNs that were used by the respondents to prevent malaria in children under-five years old. The respondents were asked to choose one option between “yes” or “no”. The respondents who chose the option “yes” were further asked to describe what they did to prevent mosquito bites.

![Figure 4.20 Respondents’ interventions (other than ITNs) to prevent mosquito bite at home (n=102)](image-url)
The majority of the respondents namely 88% (n=90) reported that they did not do anything apart from using ITNs to prevent mosquito bite, 12% (n=12) used other interventions to prevent mosquito bites. Out of the 12 respondents who had alternatives to ITNs, five sprayed insecticides (Doom) to kill mosquitoes in the house, two used mosquito coils, two burnt cow dung, one burnt leaves in the house, one boiled peach leaves to drink and one did not indicate what she did.

Indoor residual spraying (IRS) is the main alternative to ITNs that is advocated by the Malawi Ministry of Health to prevent mosquito bites (NSO and ICF Macro 2011:26). However, IRS is not common in Malawi because it is costly to provide all households with this preventive method. By the year 2010, only 3% of the households had received IRS in Malawi (Mathanga et al 2012:213; MoH 2012:22).

The use of herbs and cow dung to chase away mosquitoes has been reported by other researchers. Akogun et al (2012:1) reported that the nomadic Fulani tribe of Nigeria burned herbs in the house to create smoke to kill mosquitoes. They also used plant repellents to prevent mosquito bite. Deressa and Ali (2009:1-7) reported that mothers (26.6%) burned cow dung or leaves in the house to chase away mosquitoes in Adami Tulu district of south-central Ethiopia. The mentioned study investigated the local perceptions, practices and treatment-seeking behaviour in this community among women with under-five children.

4.6 MOTHERS’ KNOWLEDGE REGARDING MALARIA IN CHILDREN UNDER-FIVE YEARS OLD

4.6.1 Introduction

This section consisted of 52 questions (question 2.1.1 to 2.8.13) asking what the respondents actually knew about malaria and its prevention. The respondents were asked to choose the options “yes”, “no” and “I do not know”. For the sake of data analysis, the mothers’ responses were marked as correct or incorrect. For the researcher, “I don’t know” response meant an incorrect answer. Respondents were awarded one mark for each right answer. This section therefore had 52 marks (100%). The researcher involved experts to determine a competency indicator as a grading criterion of the marks scored by the respondents. The experts’ average mark of 70%
was used to measure the mothers’ knowledge regarding malaria in children under-five years old.

For further data analysis, respondents were grouped into two groups: those who scored 70% and more were in the group which was regarded as competent with the knowledge while respondents who scored less than 70% were regarded as not competent. Figure 4.21 below reflects the knowledge categories of the respondents.

![Figure 4.21 Respondents’ overall malaria knowledge](image)

Overall, 43% (n=44) of the respondents scored 70% or above and was therefore regarded as competent with knowledge about malaria, while 57% (n=58) scored below 70% and was regarded as not competent. Many Malawians lack knowledge about malaria and they consider it as just another disease (Mambo 2014:4).

### 4.6.2 Respondents’ knowledge about the causes of Malaria or fever (Question 2.1)

The first item under section 2 asked the respondents to indicate the cause of malaria. The participants were asked to choose “yes”, “no” or “do not know” against the suggested causes of malaria in the questionnaire. They were also given an opportunity to mention any other causes of malaria. Of all the respondents, 8% (n=8) reported that they did not know the cause of malaria. The responses of the majority of the respondents 92% (n=94) to this question are tabulated in the figure 4.22.
All respondents 100% (n=94) who gave responses to this item agreed that malaria was caused by plasmodium. Other causes of malaria included hot weather 26% (n=24), witchcraft 15% (n=14), poor sanitation 64% (n=60), too much sunlight 24% (n=23), playing in the rain 80% (n=75), eating sour food 43% (n=40), and eating cold food 47% (n=44). The majority, namely 100% (N=94) were correct with plasmodium (mosquito) as the cause of malaria.
Figure 4.23 shows that other respondents were incorrect (had misconceptions about causes of malaria) with hot weather 26% (n=24), witchcraft 15% (n=14), poor sanitation 36% (n=34), too much sunlight 24% (n=23), playing in the rain 80% (n=75), eating sour food 43% (40), eating cold 47% (n=44), other 3% (n=3). Eight respondents who reported that they did not know the cause of malaria were regarded as incorrect.

The following are other causes of malaria that were mentioned by three respondents:

- **Cold weather** (n=2)
- **Air** (n=2)
- **HIV** (n=1)
- **Mauka: a tradition illness** (n=1)

Respondents’ lack of knowledge and misconceptions about causes of malaria are similar to the results of studies carried out by other researchers. Dinho (2009:94) conducted a quantitative study in Tanzania to investigate measures taken by parents to prevent malaria and reported that the majority of the respondents (82,5%) said that mosquito was the cause of malaria. However, all respondents did not mention that it was protozoan parasite (plasmodium) that caused malaria which could prevent misconceptions about the causes of malaria. The respondents also indicated that malaria could be caused by the following: drinking dirty water (5%), living in a dirty environment with stagnant water (2,5%), viruses (2,5%), HIV (2,5%), ticks (2,5%), poor hygiene (2,5%) and cold weather (2,5%).

A study mentioned earlier by Deressa and Ali (2009:1-7) showed that women had knowledge of malaria, locally known as busaa but had some misconceptions. Most women (81%) mentioned that malaria is an infectious disease, 60% attributed malaria to mosquitoes. A further 38,7% incriminated sleeping together as the cause of malaria, 16,9% said breathing from the patient caused it and 4,9% blamed exposure to swampy areas and cold weather, while 1% did not know the cause of malaria which is lower than 8% in this study.

Another study in Papua New Guinea about seeking treatment for symptomatic malaria showed that people use traditional healers because they believe that the illness is
caused by sorcery or witchcraft and that modern medicine has failed (Davy et al 2010:1-9).

4.6.3 Respondents’ knowledge on how malaria or fever could be transmitted from one person to another (Question 2.2)

Of the 102 respondents, 88% (n=90) reported that they knew how malaria was transmitted from one person to another. Thus, 12% (n=12) did not know. In this question the respondents were requested to indicate either “yes” or “no” against the options as seen in the figure 4.24 below. They were also allowed to report that they “did not know” how malaria was transmitted. In addition, the respondents were given the liberty to mention other routes through which malaria could be transmitted.

Figure 4.24 Responses regarding how malaria or fever could be transmitted from one person to another (n=90)
The majority, namely 99% (n=89) indicated that malaria was transmitted through mosquito bite. The respondents also agreed that malaria could be transmitted by placental route 19%, human to human 8%, blood transfusion 32%, stagnant water 63%, weather and sun 59%. Twelve participants reported that they did not know how malaria is transmitted.

Figure 4.25 indicates that some respondents were incorrect about the transmission of malaria: mosquito 1% (n=1), placental route 81% (n=83), human to human 8% (n=7), blood transfusion 68% (n=69), stagnant water 63% (n=64), weather and sun 59% (n=60). Two respondents incorrectly mentioned that air could also aid the transmission of malaria from one person to another.

A study in Bukumbi village, Tanzania regarding measures taken by parents to prevent malaria, revealed that there were misconceptions about agents of malaria transmission which are similar to the findings in this study. Of all the participants, 50% (n=19) agreed that malaria was transmitted by infected female anopheles, contact between two people 2.5% (n=9), handling of contaminated food 35% (n=14), while 75% (n=30) agreed that drinking contaminated water was responsible for malaria transmission from one person to another (Dinho 2009:29).
4.6.4 People at risk of malaria/fever (Question 2.3)

This questionnaire item asked the respondents about people who were at risk of malaria infection. They were expected to indicate “yes” or “no” against the multiple answers as outlined in the questionnaire. As it was the case with other questionnaire items, the respondents were free to indicate that they did not know people who were at high risk of malaria infection. Not only this, but also to give other groups of people at risk of Malaria. The responses are in figure 4.26 below.

![Figure 4.26 Responses regarding people at risk of malaria or fever (n=102)](image)

![Figure 4.27 People who are at risk of malaria – correct and incorrect responses (n=102)](image)
The responses revealed that respondents were knowledgeable about people who were at risk of malaria. Almost all respondents 98% (n=100) accepted that children under-five years old were susceptible to malaria, only 2% (n=2) did not know that under-five children are at risk of malaria. Many participants, namely 91% (n=93) agreed that pregnant women were vulnerable to malaria, 7% (n=7) disagreed that pregnant women were likely to suffer from malaria, while 2% (n=2) did not know whether pregnant women were at risk of malaria or not. More than three quarters of the participants, namely 78% (n=80) agreed that people living with HIV were at high risk for malaria attacks, 20% (n=20) disagreed, while 2% (n=2) did not know whether HIV positive people were at risk or not. One of the respondents mentioned non-pregnant women as an additional group of people that was at high risk of suffering from malaria infection.

For further data analysis respondents who did not know people at risk of malaria were regarded as incorrect. Figure 4.27 shows that majority of the respondents were correct on people at risk of malaria: pregnant women 91% (n=93), under-five clinic 98% (n=100) and people living with HIV 78% (n=80).

Research has shown that mothers have some knowledge regarding malaria in children under-five years old. In a study in Enugu, Nigeria on caregivers' knowledge, attitudes and practices about childhood malaria and treatment in rural and urban communities, Oguonu et al (2005:409-412) found that 99% of urban and 74% of rural caregivers were aware of malaria as a killer disease. However, both groups did not know that under-five children and pregnant women were vulnerable to the disease as compared to the findings in this study.

**4.6.5 Respondents’ knowledge of signs and symptoms of malaria/fever (Question 2.4)**

The study respondents were asked in question 2.4 to say “yes” or “no” to the signs and symptoms of malaria that were given. They were also given a chance to mention other signs and symptoms and report if they “did not know” any clinical manifestations of the disease. The responses to the question are reflected in figure 4.28.
Figure 4.28 Responses regarding signs and symptoms of malaria (n=102)

Figure 4.29 Signs and symptoms of malaria – correct and incorrect responses (n=102)

Figure 4.29 shows that respondents overwhelmingly accepted all the eight signs and symptoms of malaria that were given in item 2.4. The majority of the respondents namely 99% (n=101) knew that fever, convulsions, and vomiting were signs and symptoms of malaria, while headache 98% (n=100), anaemia 90% (n=92), nausea 96% (n=98), anorexia 93% (n=95), and joint pains 95% (n=97).
Few respondents were incorrect with fever 1% (n=1), headache 2% (n=2), anaemia 2% (n=2), vomiting 1% (n=1), nausea 4% (n=4), anorexia 7% (n=7) and joint pains 5% (n=5) as signs and symptoms of malaria (see figure 4.29).

On other signs and symptoms, 15 respondents correctly mentioned that diarrhoea was also a sign of malaria while one incorrectly mentioned frequent water drinking as a sign and symptom of malaria. Dyspnea was another sign and symptom that was mentioned by a respondent. None of the respondents reported that they did not know signs and symptoms of malaria.

In a case-control study in Ethiopia on caretakers’ knowledge, perceptions and health seeking behaviour towards childhood malaria, Yewhalaw, Kassahun, Woldemichael, Tushune, Sudaker, Kaba, Duchateau, Bortel and Speybroek (2010:4-9) reported that signs and symptoms of malaria such as fever, headache, vomiting and nausea were well recognised as reported in this study, yet 24% of the mothers did nothing for the children with malaria.

4.6.6 Respondents’ knowledge regarding treatment of malaria (Question 2.5)

4.6.6.1 Treatability of malaria

This item started by asking the respondents to give their opinion on whether malaria could be treated or not (2.5.2 and 2.5.1). They were requested to indicate “yes” or “no”.

![Figure 4.30 Respondents’ opinion regarding treatment of malaria (n=102)](image-url)
Almost all respondents 99% (n=101) mentioned that malaria could be treated. However, one respondent was of the opinion that malaria is not a treatable disease.

In a case-control study in Ethiopia on caretakers’ knowledge, perceptions and health seeking behaviour towards childhood malaria, Yewhalaw et al (2010:4-9) reported that mothers understood malaria as a treatable disease (at-risk 98% and control 96%) which is similar to the findings of this research.

4.6.6.2 Medications for malaria treatment (n=101)

A follow-up question to question 2.5 was posed to the 101 respondents who accepted that malaria/fever could be treated. They were requested to give names of medications/drugs that they believed could be administered to children to treat malaria. They had to choose from a list of drugs which included ACT, panado (paracetamol), quinine, doxycycline, aspirin, traditional medicine and religious healing. They were also asked to mention other medications/drugs, if any, apart from those in the list. Figure 4.31 below presents the medications/drugs that respondents believed could be used to treat malaria in children under-five years old.

![Figure 4.31](image_url)

Figure 4.31 Responses regarding medications that could be used to treat malaria (n=101)
The figure gives a picture that the majority of respondents namely 84% (n=85) believed that ACT could be used to treat malaria. Other drugs included paracetamol 62% (n=63), quinine 65% (n=66), aspirin 31% (n=31), traditional medicine 1% (n=1) and religious healing 7% (n=7). Other medications/drugs which were mentioned by the respondents included penicillin and intravenous fluids. None of the respondents mentioned doxycycline as a treatment of malaria.

Respondents were correct with ACT 84% (n=85), paracetamol 38% (n=38), quinine 65% (n=66), doxycycline 0%, aspirin 69% (n=70), traditional medicine 99% (n=100) and religious healing 93% (n=94) as shown in figure 4.32 above.

Mothers' tendency of using western medicine, herbs, and religious healing to treat malaria/fever at home is similar to study results reported by other researchers. Deressa and Ali (2009:1-7) carried out a community-based study in the Adami Tulu district, south-central Ethiopia to investigate the local perceptions, practices and treatment-seeking behaviour for malaria among women with under-five children. In that study 18% relied on unspecified injections, 14,6% reported the use of chloroquine, 3,7% used
herbal remedies (garlic, ginger and local leaves), and only 0.3% reported the use of religious healing such as holy water and traditional medicine compared to 7% in this study. Less than 1% of the mothers did not know the treatment of malaria.

4.6.7 Breeding places of mosquitoes (Question 2.6)

Respondents were asked about mosquito breeding places as another way of evaluating their knowledge of malaria. They had to indicate “yes” or “no” against the suggested mosquito breeding places. Figure 4.33 below shows the opinions of the respondents as regards to mosquito breeding places like stagnant water, places of poor hygiene and close to rivers. The respondents were also allowed to mention other places where mosquitoes could breed or report if they “did not know” where mosquitoes breed.

![Figure 4.33 Responses regarding breeding places of mosquitoes (n=102)](Image)
The majority of the respondents answered this question positively: 95% (n=97) knew that mosquitoes could breed in stagnant water, while 5% (n=5) were not sure whether mosquitoes breed in stagnant water or not. Many respondents, namely 91% (n=93) reported that mosquitoes like breeding in places where there was poor hygiene, 5% (n=5) did not know whether dirty places provided good breeding areas for mosquitoes or not. The data also showed that 88% (n=90) of the respondents agreed that mosquitoes breed in places that are close to rivers, 7% (n=7) disagreed, while 5% (n=5) were undecided. Some respondents also reported that mosquitoes could breed in dark places such as bushes, corners of houses, bathrooms, bins and maize fields.

Figure 4.34 shows that respondents were correct with stagnant water 95% and close to rivers 88%, while the majority, namely 91% were incorrect that mosquitoes breed in places of poor hygiene.

4.6.8 Malaria Prevention (Question 2.7)

Question 2.7 asked the respondents whether they believed that malaria could be prevented or not. They were expected to agree or disagree that malaria was preventable.
All respondents 100% (n=102) agreed that malaria is a preventable infectious disease.

4.6.8.1 Malaria preventive measures

After answering question 2.7, respondents were asked to indicate whether each one of the malaria preventive measures in figure 4.36 below always worked well, sometimes worked and did not work at all.

Figure 4.36  Responses regarding malaria preventive measures (n=102)
The findings indicate that the majority of the respondents, namely 75% (n=74) had the opinion that ITNs always worked well against malaria. The respondents also reported that other malaria preventive measures also worked well: indoor residual spray 32% (n=33), prompt treatment 52% (n=51), coils 17% (n=17), repellents 31.4% (n=32), good personal hygiene 16.7% (n=17), eating healthy food 18.6% (n=19), drainage of sites where mosquito could breed 51.0% (n=52), burning cow dung/leaves in the house 21.6% (n=22), blockage of holes 29.4% (n=30), keeping doors/windows closed 25.5% (n=26), killing mosquitoes when they are seen 22.5% (n=23), use of medication to prevent malaria 47.1% (n=48) and IPTp 51% (n=52).

Some respondents were of the opinion that malaria preventive measures tabulated in the figure 4.36 above sometimes worked: ITNs 22% (n=23), indoor residual spray 54% (n=55), prompt treatment 30% (=31), coils 61% (n=62), repellents 36.3% (n=37), good personal hygiene 20.6% (n=21), eating healthy food 21.6% (n=22), drainage of sites where mosquito could breed 20.6% (n=21), burning cow dung/leaves 41.2% (n=42), blockage of holes where mosquito could enter the house 39.2% (n=40), keeping doors/windows closed 44.1% (n=45), killing mosquitoes when they are seen 42.2% (n=43), use of medication 24.5% (n=25) and IPTp 21.6% (n=22).
However, other respondents indicated that malaria preventive methods in figure 4.36 above never worked at all: ITNs 4% (n=4), indoor residual spray 14%(n=14), prompt treatment 19% (=19), coils 22% (n=23), repellents 32,3% (n=33), good personal hygiene 62,7% (n=64), eating healthy food 59,8% (n=61), drainage of sites where mosquitoes could breed 28,4% (n=29), burning cow dung/leaves in the house 37,2% (n=38), blockage of holes where mosquito could enter the house 31,4% (n=32), keeping doors/windows closed 30,4% (n=31), killing mosquitoes when they are seen 35,3% (n=36), use of medication to prevent malaria 28,4% (n=29) and IPTp 27,4% (n=28).

Figure 4.37 shows that correct responses were obtained on the use of ITNs 96% (n=98), indoor residual spray 86% (n=88), prompt treatment 81% (n=83), coils 78% (n=80), repellents 67.7% (n=69), eating healthy food 59.8% (n=61), drainage of sites 71.6% (n=73), burning cow dung/leaves 62% (n=63), blockage of holes 31.4% (n=32), keeping doors/windows closed 30.4% (n=31), mechanical killing of mosquitoes 35.3% (n=36) and IPTp 72.6% (n=74).

Several studies elsewhere reported similar findings. According to Dinho (2009:96), in a study to investigate measures taken by parents to prevent malaria in Tanzania, found that 42,5% (n=17) of the respondents did not know how malaria could be prevented. However, other respondents mentioned malaria preventive methods such as mosquito net (32,5%), environmental hygiene (10%), food hygiene (2,5%), boiled water (2,5%), repellent creams and sprays, screened windows, not eating dirty food (7,5%), nutritious food (2,5%), clean net (2,5%), and coils (2%).

The study referred to previously in the Adami Tulu district, south-central Ethiopia on preventive measures reported that 94% knew that malaria is a preventable disease which is lower than reported in this study 100%. In this study 5% reported that malaria could not be prevented, while 1,4% did not know whether it could be prevented or not. Eight hundred and thirty seven mothers (40,1%) heard about mosquito net but only 5,6% of all surveyed mothers owned any type of mosquito net. Malaria prevention methods that were used included: drainage of mosquito breeding sites (44,6%), to burn cow dung or leaves in the house (24,6%), blockage of mosquito entry holes (19,4%), use of aerosol sprays (14,3%), closing doors and windows (10,5%), and mechanical killing of mosquitoes (9,3%). At least 33,3% of the mothers did not know any malaria preventive measure (Deressa & Ali 2009:1-7).
Idowu et al (2008:210) studied perceptions and home management practices of malaria in rural Abeoukutu, Nigeria and reported that the majority of respondents, namely (74%) used insecticide coils and surprisingly none used ITNs.

In a case-control study in Ethiopia on caretakers’ knowledge, perceptions and health seeking behaviour towards childhood malaria, Yewhalaw et al (2010:4-9) reported that mothers took ITNs as a preventive measure against malaria but they did not know the role of IRS.

4.6.9 Respondents’ source of information about malaria (Question 2.9)

The researcher used this item to identify the sources of information about malaria that influenced the respondents’ knowledge regarding malaria in children under-five years old. The respondents were asked to indicate “yes” or “no” on the given options which included husband, other family members, friends, health workers, television, radio, posters, and information leaflets. They were also allowed to mention other sources of information and indicate if they never got any information about malaria whatsoever.

![Figure 4.38 Responses regarding sources of information about malaria (n=102)](chart)

The figure above shows that respondents obtained malaria information from different sources including husband 75% (n=77), other family members 93% (n=95), friends 95% (n=97), health workers 98% (n=100), television 32% (n=33), radio 62% (n=63), posters 64% (n=65), and information leaflets 51% (n=52).
Few respondents reported other sources of malaria information, namely drama 1% (n=1) and church pastors 1% (n=1). This is not strange as malaria is a very big problem and everybody is at risk in the Thyolo district. Community leaders and drama groups include malaria in their programmes to promote its awareness.

The majority of rural Malawians do not have durable consumer goods. The unavailability of consumer goods indicates the low socioeconomic status of the households. There is no doubt that certain goods have specific benefits. For instance, having access to radio or television exposes mothers and other household members to malaria messages and other health-related topics. Country data reveals that 53% of Malawians own a radio. The ownership of the radio is higher in urban (70%) compared with rural areas (50%). Only 11% of Malawian households own a television: urban (34%) and 6% in rural areas which is lower than the finding of this study because 32% and 62% of the respondents got malaria information through television and radio respectively (NSO & ICF Macro 2011:30).

According to NSO & ICF Macro (2011:30), few women in Malawi are exposed to media. Only 12% and 16% of women read the newspaper and watch television respectively at least once a week. However, many women (57%) listen to the radio on a weekly basis and this has been reflected by the findings of this study.

Many women in the Thyolo district are not exposed to mass media. Percentages of women aged 15-49 in Thyolo that are exposed to specific media on a weekly basis are as follows:

- **Newspaper (8,5%)**
- **Television (10,5%)**
- **Radio (61,4%)**

However, only 3.1% of women aged 15-49 in the Thyolo district are exposed to all three media above, namely newspaper, television and radio. A significant percentage (36.0%) of women in the district has no access to media on a weekly basis (NSO & ICF Macro 2011:288).

Malaria information is obtained through different sources and media outlets. Howard et al (2010:1-4) undertook a study in Afghanistan on insecticide-treated net purchasing,
coverage and usage. The study showed that women obtained malaria knowledge from clinic staff, their husbands and female peers. This is in line with the findings of this survey.

The study referred to previously in Bukumbi village, Tanzania reported that 73.3% of caregivers obtained malaria information from radio which is higher than 62% reported in this study, 73.3% from printed media, 70% from health personnel which is lower than 98% reported in this study, 96.7% from other villagers, and 3.3% from television which is much lower than 32% found in this study (Dinho 2009:86).

4.6.10 Respondents’ problems when their children were ill with malaria and help was needed (Question 2.10)

This item was set to determine whether respondents experienced problems when their children were ill with malaria and treatment was needed. It assessed whether problems like “the distance from the hospital, money, and time it took at the hospital to get treatment” were some of the problems. The respondents were also asked to indicate any other problems that they faced in the process of utilising health care services whenever their children had malaria/fever. Furthermore, the respondents were expected to report whether the suggested problem was always, sometimes or never a problem at all. Figure 4.39 below reflects the responses to this questionnaire item.

![Figure 4.39](image-url)
The majority of respondents namely 73.5% (n=75), reported that distance from the hospital was always a problem. According to the respondents, other problems that always hampered prompt treatment of malaria in children under-five years old were money 69.6% (n=71) and time it took to get treatment at the hospital 41.2% (n=42).

A good number of respondents indicated that the problems in figure 4.39 above were “sometimes” problems: distance from the hospital 12.8% (n=13), money 20.6% (n=21) and time it took to get treatment at the hospital 29.4% (n=30).

However, there were other respondents who did not experience the items in figure 4.39 as problems: distance from the hospital 13.7% (n=14), money 9.8% (n=10), and time it took to get treatment at the hospital 29.4% (n=30).

Other problems that respondents reported include:

- Unavailability of soap to wash clothes before visiting the health facility 1% (n=1)
- Lack of anti-malarial drugs in some of the Thyolo district health facilities 1% (n=1)
- Negative attitudes of nurses who rest at the work place when their services are needed most by the consumers of health care 1% (n=1).

Transport is a problem for many Malawians and the Thyolo district in particular as reported by the respondents. Data shows that 40% of households own a bicycle, while only 2% own a car or truck and a similar percentage has an animal-drawn cart. The bicycle and animal-drawn carts are mostly found in rural areas while cars are common in urban areas (NSO & ICF Macro 2011:22).

Dinho (2009:138) reported in the study in Bukumbi village, Tanzania that some parents experienced problems such as a lack of money, hospital delays, and unavailability of transport whenever their children were ill and treatment was needed. These problems are in agreement to the findings of this study.

Delay by health care workers is also a problem in Malawi mainly due to a high workload and shortage of health workers including nurses. The country’s vacancy for nurse and midwives stands at more than 70 percent (Mthawanji 2014:3). This negatively affects
health care delivery and proper communication between health care workers and the patients (MoH 2008:1).

Several studies by Chirdan et al (2008:112-119) in Jengre, Nigeria, Deressa and Ali (2011:939-945) in Ethiopia, Idowu et al (2008:210) in rural Abeoukutu, Nigeria, Kahuka et al (2012:1-10) in the Tanga region, Tanzania, Mesa (2012:93-98) in Turbo, Colombia, and Munthali (2005:127-136) in rural Malawi showed that there are barriers to treatment-seeking behaviour in febrile children. The researchers reported that factors that affect health-seeking behaviour included availability of diagnostic facilities (blood smear), availability of drugs, cumbersome paperwork (completing clinic paperwork delayed treatment), unavailability of appropriate services at public clinics, a long waiting time, overcrowding, and appropriate drug prescription in the absence of laboratory test, lack of urgency, and partial drug administration like injections not administered as prescribed. Some of these healthcare problems were also reported by the respondents of this research.

Distance from the health facility influences health-seeking behaviour. Several studies reported that caretakers of children delay in seeking the appropriate malaria treatment and preventive measures partly because of long distances to the health facilities. These studies were done in Nigeria (Chirdan et al 2008:112-119; Idowu et al 2008:210); and Okeke & Okeibunor 2010:62-67), India (Das & Ravindran 2010:5), Ethiopia (Deressa & Ali 2009:8), in Malawi (Kizito et al 2012:1; Larson et al 2012:1; and Munthali 2005:127-136), in Colombia (Mesa 2012:93-98), and in Myanmar (Xu et al 2012:1). Distance was also reported to be a problem in this study. Usually, health facilities are located near markets, schools and other government infrastructures. Families around the health services enjoy higher socio-economic status through market activities, education and employment opportunities than those who live far away from health services. Proximity to the health facilities means no time and transport problems.

4.6.11 Respondents’ reasons for seeking children's malaria treatment at a health facility (Question 2.11)

Respondents were asked in question 2.11 of the questionnaire to indicate reasons why they decided to seek health care at a health facility. They had to choose “yes” or “no”
against each reason as depicted in the figure 4.40 below. The respondents were also allowed to mention other reasons, if any, apart from those in the table.

Figure 4.40 Responses regarding reasons for seeking children’s malaria treatment at a health facility (n=102)

For the sake of data analysis and presentation health education at health facility and advice from health workers were regarded as one reason from the health institution. Thus, only advice from the health workers appeared in the figure 4.40 above.

Despite the problems that respondents experienced when their children had malaria and treatment was needed, they sought treatment from the health facility because of the following: television programmes on malaria 38% (n=39), radio programmes on malaria 61% (n=62), advice from friends 89% (n=91), advice from family members 92% (n=94), death of a child due to malaria (her own, family member or friend’s) 34% (n=35), posters at health facility 75% (n=76), and advice from health workers 89% (n=91).
On other reasons, one respondent mentioned that she sought treatment at the health facility because her child had pneumonia episode during the month preceding the interview.

4.7 ASPECTS OF MALARIA DISEASE THAT RESPONDENTS WANTED TO KNOW

The final question in the questionnaire requested respondents to mention what they wanted to know about malaria disease. This was an open-ended question. Although the data indicated that many respondents were not competent with malaria knowledge, the majority of them, namely 78% (n=80) did not mention an area that they wanted to know about malaria. This was surprising because the researcher expected them to be hungry for malaria information by asking many questions about the disease. This could be attributed to the fact that most of the respondents were uneducated and were too shy to ask for details about certain aspects of the disease.

However, 22% (n=22) wanted to understand the following aspects about malaria:

- The cause of malaria
- Types of malaria
- Type of mosquitoes that transmit malaria
- Reason why malaria patients vomit, lose consciousness, and show signs of confusion and anaemia
- Prevention of malaria
- Gender of mosquitoes that transmit malaria
- Effectiveness of ITNs against malaria
- Resistance of malaria to anti-malarial drugs
- Reason for not using mosquito bed nets in the hospital
- The use of vaccine in malaria prevention
- When would she receive a mosquito net
- Trans-placental (mother to child) malarial transmission
4.8 OVERVIEW OF RESEARCH FINDINGS

The majority of the respondents, namely 57.8% (n=59) were in the age category of 20-29 years and 11.8% (n=12) were teenagers. Most of respondents 78% (n=80) were married, while fewer than 5% were never married. The majority of the participants, namely 75% (n=77) belonged to Lhomwe tribe.

On education, 17.6% (n=18) of the respondents never attended school, while fewer than 3.9% (n=4) had at least a college/university qualification. Half of the respondents 50%; (n=51) did not have a primary school qualification. The majority of the respondents 94% (n=96) were Christians and only 3% (n=3) were Muslims.

Employment was a problem to most of the respondents. Of 102 respondents 81% (n=83) were unemployed. About half 46.1% (n=47) of the respondents earned k0-k9999 equivalent to US$23 per month at the current exchange rate and 72% (n=73) of the respondents lived in temporary houses. This indicated that most of the respondents lived below poverty line.

Many children 34% (n=35) who were admitted to the hospital and treated for malaria were in the age group 24-35 months. The minimum age of the children was 6 months and the maximum age was 59 months. The majority of participants, namely 81% (n=83) knew correct medical diagnosis of their children and about half of them, namely 51% (n=52) sought malaria treatment at a health facility within the recommended 24 hours following the onset of illness. Over half of the respondents, namely 55% (n=56) administered medications at home before the children were admitted to hospital.

Of the 56 respondents who administered medications to the children at home, the majority, namely 33 (59%) administered paracetamol (panadol), anti-malarial drugs 18% (n=10). Traditional medicine, religious healing and antibiotics were also administered.

Most of the children, namely 62% (n=63) slept under ITNs at home before admission to hospital, while 38% (n=39) never used an ITN. Of 63 children who slept under INTs, 52% (n=33) of them always slept under the net, 48% (n=30) did not use the net all the time, but sometimes.
Of the participants who did not use mosquito bed nets, 67% (n=26) reported that unavailability of the nets was the reason why they did not use bed nets to protect children against mosquito bite. The majority of the respondents, namely 88% (n=90) reported that they did not do anything apart from using ITNs to prevent mosquito bite. Apart from ITNs, other respondents used doom, mosquito coils, burnt cow dung and leaves to chase away mosquitoes and boiled peach leaves.

Overall, 43% (n=44) of the respondents were competent with malaria knowledge before the interview. Many participants 100% (n=94) agreed that malaria was caused by mosquito (plasmodium). Other respondents agreed that hot weather 26% (n=24), witchcraft 15% (n=14), poor sanitation 64% (n=60), too much sunlight (24% (n=23)), playing in the rain 80% (n=75), eating sour food 43% (n=40), and eating cold food 47% (n=44) could also cause malaria.

On transmission, the majority of participants namely 99% (n=89) agreed that malaria was transmitted through mosquito bite. Some respondents also agreed that malaria could be transmitted from one person to another through human to human 8% (n=7), blood transfusion 32% (n=29), stagnant water 63% (n=57), weather and the sun 41% (n=37).

Many respondents agreed that children under-five years old 98% (n=100), people living with HIV 78% (n=80) and pregnant women 91% (n=93) were at risk of malaria infection.

The majority of the respondents, namely 99% (n=101) knew that fever, convulsions, and vomiting were signs and symptoms of malaria. According to the respondents other clinical manifestations of malaria included headache 98% (n=100), anaemia 90% (n=92), nausea 96% (n=98), anorexia 93% (n=95), and joint pains 95% (n=97).

Almost all respondents 99% (n=101) agreed that malaria could be treated and 84% (n=85) believed that ACT could be used to treat malaria, paracetamol 62% (n=63), quinine 65% (n=66), aspirin 31% (n=31), traditional medicine 1% (n=1) and religious healing 7% (n=7).
Majority of the respondents, namely 95% (n=97) knew that mosquitoes could breed in stagnant water, places where there was poor hygiene 91% (n=93) and close to rivers 88% (n=90).

On malaria prevention, the respondents reported that the following worked well: ITNs 75% (n=74), indoor residual spray 32% (n=33), prompt treatment 52% (n=51), coils 17% (n=17), repellents 31.4% (n=32), good personal hygiene 16.7% (n=17), eating healthy food 18.6% (n=19), drainage of sites where mosquito could breed 51.0% (n=52), burning cow dung/leaves in the house 21.6% (n=22), blockage of holes 29.4% (n=30), keeping doors/windows closed 25.5% (n=26), killing mosquitoes when they are seen 22.5% (n=23), use of medication to prevent malaria 47.1% (n=48) and IPTp 51% (n=52).

Many respondents obtained malaria information from husband 75% (n=77), other family members 93% (n=95), friends 95% (n=97), health workers 98% (n=100), television 32% (n=33), radio 62% (n=63), posters 64% (n=65), and information leaflets 51% (n=52).

Problems that hampered prompt malaria treatment were distance 73.5% (n=75), money 69.6% (n=71) and time it took to get treatment at the hospital 41.2% (n=42).

Mothers sought treatment from the health facility because of television programmes on malaria 38% (n=39), radio programmes on malaria 61% (n=62), advice from friends 89% (n=91), advice from family members 92% (n=94), death of a child due to malaria (her own, family member or friend’s) 34% (n=35), posters at health facility 75% (n=76), and advice from health workers 89% (n=91).

4.9 CONCLUSION

Many respondents in the study were not competent with malaria knowledge in children under-five years old and there was a delay in seeking treatment. Factors that were associated with mothers’ knowledge, attitudes and practices regarding malaria are discussed in chapter 5.
CHAPTER 5

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The aim of this study was to describe mothers’ knowledge, attitudes and practices regarding malaria in children under-five years old in order to recommend strategies that would improve health-seeking behaviour of mothers. The researcher also investigated mothers’ demographic and socio-cultural factors because they could influence mothers’ knowledge, attitudes and practices regarding malaria in children under-five years old.

Malaria is one of the major diseases that claim many lives of children under-five years old in Malawi and it impedes the achievement of MDG 4 and other MDGs. In order to reduce child mortality by the year 2015, as recommended by MDG 4 (reduce child mortality by two-thirds by the year 2015), it was essential to investigate mothers’ knowledge, attitudes and practices that could influence malaria-attributable mortality in under-five children in the health facilities in Malawi. An understanding of mothers’ knowledge, attitudes and practices assisted in planning effective interventions to promote mothers’ knowledge and treatment-seeking behaviour regarding malaria in children under-five years old.

5.2 DATA ANALYSIS PROCESS

The chi-square test ($x^2$) was applied and it is reported in this chapter. The researcher used 5% (0.05) as a level of significance for data analysis of this research. This means that:

- The difference observed in the study findings was statistically significant if $p<0.05$
- The difference observed in the study results was not statistically significantly if $p>0.05$
Competency indicator was used to distinguish between levels of knowledge for the mothers. Those who scored 70% and above were regarded as competent while respondents who scored below 70% were regarded as not competent with the knowledge about malaria (section 4.6.1).

5.3 STUDY FINDINGS

5.3.1 Section 1: mothers’ knowledge regarding malaria in children under-five years old

This section discusses the influence of mothers’ economic-demographic characteristics on their knowledge regarding malaria in children under-five years old.

5.3.1.1 Influence of mothers’ age on malaria knowledge in children under-five years old

Over half of the mothers 57.8% (n=59) were in the age category of 20-29 years and 11.8% (n=12) were teenagers. For the sake of data analysis, respondents were divided into teenagers (19 years and below) and adults (above 19 years). Age appeared to have an influence on mothers’ knowledge regarding malaria in under-five: $x^2 = 5.629$, df=1 and p=0.018. Teenage mothers were more likely to be competent with malaria knowledge compared with adult mothers.

This study finding is not in agreement to the finding of a study that was conducted in West Africa by Jombo et al (2011:10-14). They investigated malaria self-medications and choices of anti-malarial drugs and reported that anti-malarial knowledge among the respondents was not associated with age of the mother.

5.3.1.2 Influence of marital status on mothers’ knowledge regarding malaria in children under-five years old

For mothers of children under-five years old in the Thyolo district a higher rate of marriage unions of 78% (n=80) than the national population of Malawi 59% was indicated. Malawian women believe in getting married because of the social security (Makuta 2009:49).
For the sake of data analysis, the respondents were divided into two categories: married 78.4% (n=80) and unmarried 21.6% (n=22).

In this study, marital status was not a significant factor associated with mothers’ knowledge regarding malaria in children under-five years old: \( x^2 = 0.57, \text{df}=1, p=0.812 \).

Other studies have shown that mothers’ marital status may influence malaria knowledge. According to Jombo et al (2011:10-14), the study mentioned in the previous section, knowledge related to malaria among the respondents was associated with marital status. Married women had a higher level of malaria knowledge compared with their unmarried counterparts. This is in contrast to the findings of this study.

**5.3.1.3 Influence of education on mothers’ knowledge regarding malaria in under-five children**

Half of the respondents in this study 50% (n=51) were not regarded as educated meaning that they had no education qualification (section 4.4.4). The data showed that 17.6% (n=18) of the participants never attended school at all. This finding is consistent with the findings of a national survey by NSO and ICF Macro (2011:284) that 12.6% of women aged 15-49 in Thyolo district had no education, while 60% had some primary education. Respondents with educational qualifications were compared with those without educational qualifications.

This survey showed that education was significantly associated with respondents’ knowledge regarding malaria in children under-five years old: \( x^2 = 10.232, \text{df}=1, p=0.001 \). An analysis of the data showed that all nine teenagers who were competent with malaria knowledge were also educated.

The study findings are consistent with the results reported by Jombo et al (2011:10-14) in the study mentioned above. They reported that knowledge related to malaria among the respondents was associated with higher educational level (from 25.5%, 73.4%, 98.8% to 100% respectively, compared to those with nil, primary, secondary and tertiary education respectively).
5.3.1.4 Influence of income on mothers’ knowledge regarding malaria in children under-five years old

The study showed that most of the mothers 56.9% (n=58) had a low income. This means that they were living below the poverty line (spending less than US$1 per day) and in Malawian terms it means that they get less than US$36 per month (section 4.5.7).

The findings of this survey revealed that income was also one of the factors that influenced mothers’ knowledge regarding malaria in children under-five years old: \( x^2 = 8.029, \text{df}=1, p=0.005 \). This is not surprising because most people with a high income are also educated and are likely to be competent with malaria knowledge.

The finding of this survey is in line with the study by Jombo et al (2011:10-14) that pointed out that knowledge related to malaria among mothers is associated with family wealth. The study showed that anti-malarial knowledge was strongly related to an increasing wealth index.

5.3.1.5 Influence of type of a house on mothers’ knowledge regarding malaria in children under-five years old

The majority of mothers, namely 72% (n=73) lived in temporary houses meaning houses made from unburnt bricks, poles and grass, and bricks and mud, while only 28% (n=29) had permanent houses meaning houses made from burnt bricks and cement (section 4.4.8). The type of a house indicates the socio-economic status of people. Poor people usually live in temporary houses. Respondents with temporary houses were compared with those who had permanent houses regarding malaria knowledge.

There was a significant difference between mothers’ type of a house and their knowledge regarding malaria in children under-five years old: \( x^2 = 9.615, \text{df}=1, p=0.002 \). Mothers who had permanent houses were likely to have a higher level of malaria knowledge compared with those who had temporary houses.
5.3.1.6 Influence of age of admitted children on mothers’ malaria knowledge

The minimum age of admitted children was 6 months and the maximum age was 59 months. There was no significant association between age of the child and mothers’ malaria knowledge: $x^2 = 4.318$, df=4, p=0.365

This finding is in agreement with study findings reported by other researchers. Getahun et al (2010:1-5) in a study in south-west Ethiopia regarding determinants of malaria treatment delay in under-five children reported that the age of the child did not influence mothers’ malaria management in under-five children. It is acknowledged that the mentioned study was about the health seeking behaviour, but to an extent knowledge will influence it.

The study by Jombo et al (2011.10-14), reported that age of children was not a contributory factor. Anti-malarial knowledge was the same between those with children under the age of five years and those with order children.

5.4 SECTION 2: SOURCE OF INFORMATION

This section presents cross-tabulations which were done between source of information and mothers’ malaria knowledge.

5.4.1 Influence of television as source of information on mothers’ knowledge regarding malaria in children under-five years old

Some mothers, namely 32% (n=33) reported that they obtained malaria information from television. Only 10.5% of women aged 15-49 in the Thyolo district are exposed to television weekly (NSO & ICF Macro 2011:30).

Television as a source of malaria information was a significant factor associated with mothers’ malaria knowledge in children under-five years old: $x^2 = 8.357$, df=1, p=0.004. Television could help in promoting mothers’ malaria knowledge as it presents both pictures and messages about the disease. However, few Malawians, especially in the rural areas, own a television.
5.4.2 Influence of radio as source of information on mothers’ knowledge regarding malaria in children under-five years old

More than half of the mothers, namely 62% (n=63) accessed malaria information through the radio. Radios are owned by over half of Malawian households. In the Thyolo district, 61% of women aged 15-49 listen to the radio at least once per week, indicating consistency with the study findings. A higher number of women has access to radio.

Radio was significantly associated with mothers’ malaria knowledge in children under-five years old: \( \chi^2 = 7.880, \text{df}=1, p=0.005 \). In a MoH malaria indicator survey it was reported that radio is the second common source of malaria information after government clinic or hospital. The survey reported that over 40% of women in Malawi are exposed to malaria messages from the radio as compared to 62% in this study (MoH 2012:4).

5.4.3 Influence of posters as sources of information on mothers’ knowledge regarding malaria in children under-five years old

Many mothers, namely 64% (n=65) got malaria information from the posters. This is consistent to educational attainment of women aged 15-49 years in the Thyolo district where about 60% have some primary education. This means mothers could read posters that carry malaria messages in local language.

In this study, posters were found to be significantly associated with mothers’ malaria knowledge in children under-five years old: \( \chi^2 = 13.883, \text{df}=1, p=0.00019 \).

This p-value indicates that posters strongly influence mothers’ knowledge regarding malaria in under-five children. Posters carry malaria information together with pictures which may help to educate both literate and illiterate mothers.
5.4.4 Influence of husband as a source of information on mothers’ knowledge regarding malaria in children under-five years old

The majority of mothers 75% (n=77) agreed that their husbands were the source of information about malaria (section 4.6.9). This study revealed that a husband was not a significant factor associated with mothers’ knowledge regarding malaria in children under-five years old: $x^2=1.675$, df=1, p=0.196

This finding is not in agreement to other findings reported by different researchers. For example, Jombo et al (2011:10-14) in West Africa reported that married mothers had better malaria knowledge compared with their unmarried counterparts.

5.4.5 Influence of family members as sources of information on mothers’ knowledge regarding malaria in children under-five years old

The majority of mothers namely 93% (n=95) indicated that they got malaria information from their family members. This was not significantly associated with mothers’ malaria knowledge in children under-five: $x^2=2.551$, df =1, p=0.110.

5.4.6 Influence of friends as sources of information on mothers’ knowledge regarding malaria in children under-five years old

Ninety-five percent (n=97) of the mothers who were interviewed agreed that friends were sources of information about malaria. The study showed that friends were not significantly associated with mothers’ malaria knowledge in children under-five years old: $x^2=3.989$, df=1, p=0.046.

A study in Afghanistan by Howard et al (2010:1-4) on ITN purchasing, coverage and usage showed that women obtained malaria knowledge from their female peers.
5.4.7 Influence of health workers as sources of malaria information on mothers’ knowledge regarding malaria in children under-five years old

Almost all the mothers 98% (n=100) indicated that health workers were sources of malaria information. Health workers have the responsibility to teach patients and the communities about all health related conditions including malaria. Health workers’ influence surprisingly, was not significantly related to mothers’ knowledge about malaria in children under-five years old: $x^2=1.548$, df=1, p=0.213.

This is in contrast to the findings of a malaria survey conducted by MoH (2012:4) which indicated that government clinic or hospital is the number one source of malaria messages though not significantly related to mothers’ malaria knowledge. In the survey, about half (49%) of the women mentioned government clinic or hospital as the place where they saw or heard about malaria and community health workers (15%).

5.4.8 Influence of leaflets as sources of information on mothers’ knowledge regarding malaria in children under-five years old

Over half of the mothers 51% (n=52) reported that information leaflets were their sources of information about malaria. In this study, information leaflets were not significantly associated with mothers’ malaria knowledge: $x^2=3.338$, df=1, p=0.068.

5.5 SECTION 3: MOTHERS’ ATTITUDES, AND PRACTICES REGARDING MALARIA IN CHILDREN UNDER-FIVE YEARS OLD

This section covers the factors that influence mothers’ attitudes and practices regarding malaria in children under-five years old. These include socio-economic and demographic characteristics.

5.5.1 Influence of mothers’ age on the use of ITNs at home to protect the children against malaria

A cross tabulation was done between mothers’ age in two categories (teenagers and adults) and the use of ITNs before hospitalisation. Mothers’ age was not associated with
the use of mosquito bed nets as a malaria preventive measure: $x^2=0.138$, df=1, p=0.710.

5.5.2 Influence of mothers’ age on the use of other methods other than ITNs to protect children against mosquito bites

There was no association between mothers’ age and the use of other methods apart from a mosquito net to protect children under-five years old against mosquito bite: $x^2=0.154$, df=1, p=0.694.

5.5.3 Influence of mothers’ age on home-treatment before admission to hospital

Over half of the mothers, namely 55% (n=56) reported that they administered medications at home before the children were admitted to hospital. There was no association between mothers’ age and the use of medications to treat children at home before admission to hospital: $x^2=0.962$, df=1, p=0.327.

This study supported the findings of Chirdan et al (2008:112-119) in a study to assess impact of health education on home treatment and prevention of malaria in Jengre, north-central Nigeria. The researchers reported that there was no association between mothers’ age and promptness of fever treatment as well as first action taken at home to treat children with symptoms of malaria.

5.5.4 Influence of mothers’ educational level on treatment-seeking behaviour

As discussed above, half of the mothers had no educational qualification and education was found to be one of the factors that had an impact on mothers’ knowledge regarding malaria in children under-five years old. A cross-tabulation was also done between mothers’ educational level attained and duration of illness before the child was hospitalised. Education was significantly associated with early treatment-seeking behaviour. Educated mothers were likely to seek malaria treatment within 24 hours of fever onset: $x^2=5.649$, df=1, p=0.017.
Education influences the lifestyle and societal status of people. According to NSO & ICF Macro (2011:11) there is a relationship between education attainment and health-related behaviours and attitudes of people towards illness. Educated people utilise health services more than those who have little or no education at all (MoH 2011:17).

Studies by Chirdan et al (2008:112-119) in Nigeria; Holt et al (2003:491-493) in Blantyre, Malawi; Okeke and Okeibunor (2010:62-67) in south-east Nigeria; Klein et al (2012:3-4) in Ghana, and Yadav (2010:235) in Rajasthan, India, all noted that prompt treatment of febrile illness in children was associated with educational status of the mothers which is similar to the findings of this research. Mothers with less than primary level education were likely to delay febrile illness treatment.

In contrast, in a study in south-west Ethiopia about determinants of malaria treatment delay in under-five children revealed that mothers’ educational level was not related to delay in diagnosis and treatment of malaria in under-five children (Getahun et al 2010:1-5)). Similar findings were also found in a study in Ethiopia which indicated that mothers’ educational level was not strongly associated with early treatment-seeking behaviour (Deressa & Ali 2011:939-945).

5.5.5 Influence of mothers’ employment status on duration of child’s illness before hospitalisation.

The majority of mothers, namely 81% (n=83) were unemployed. The study showed that there was no association between mothers’ employment status and time it took before the child was brought to the hospital for medical attention: $x^2=0.736$, df=1, p =0.391.

In support of this study findings, Getahun et al (2010:1-5) in the study in Ethiopia mentioned above reported that mothers’ occupational status was not related to delay in diagnosis and treatment of malaria in children under-five years old.
5.5.6 Influence of mothers’ educational level on the use of ITNs

Of all the mothers, 62% (n=63) indicated that the children slept under ITNs at home before admission to hospital.

Although education influences mothers’ knowledge on malaria, mothers’ educational level attained was not significantly associated with the use of ITNs to protect children under-five years old against malaria: \( x^2 = df=1, p=0.154 \)

5.5.7 Influence of income on the use of ITN to protect children under-five years old against mosquito bites

Income was not a factor that was associated with the use of ITN to prevent malaria in children under-five years old: \( x^2=0.563, df=1, p=0.453 \). The reader is reminded that in this study over half of mothers, namely, 56.9% (n=58) lived below the poverty line, spending less than US$1 per day.

5.5.8 Influence of mothers’ educational level on treatment at home before hospitalisation

Although half of the mothers 50% (n=51) did not possess any academic qualification, 55% (n=56) administered medications to treat children at home before visiting the hospital.

The survey revealed that mothers’ educational level attained was not associated with mothers’ self-prescription and administration of drugs to manage malaria or fever in children under-five years old at home: \( x^2=0.0001, df=1, p=1.00 \).

Getahun et al (2010:1-5) in the Ethiopian study mentioned previously determined that mothers’ educational level was not related to delay in treatment of malaria in children under-five years old. This is similar to the findings of this research.
5.5.9 Influence of mothers’ income on treatment at home before hospitalisation

The study indicated that mothers’ income was not associated with the use of medication to treat malaria or fever at home prior to hospital visit: $x^2=1.305$, df=1, p=0.253. As stated above, most mothers 56.9% (n=58) were poor.

The findings of this study are in contrast to the findings in a study in six African countries (Benin, Democratic Republic of Congo, Madagascar, Nigeria, Uganda and Zambia) which revealed that children from rich families in Benin, Democratic Republic of Congo, Madagascar and Nigeria were more likely to receive anti-malarial drugs like ACT at the hospital than poor children. Poor mothers treat their children with other drugs that are available at home (Littrell et al 2011:1).

5.5.10 Influence of number of children that passed away due to malaria on home-treatment before admission to hospital

Sixteen mothers lost a child or more by the time of interviews. Of these, seven died of malaria. The findings of this study revealed that mothers who lost a child due to malaria were likely to administer medications to the children at home before visiting the health facility: $x^2=5.878$, df=1, p=0.015. This result surprised this researcher because he argued that mothers who lost children due to malaria were expected to be aware of the complications of the disease including death. May be they were aware of what might happen and were extra cautious. They were not expected to immediately initiate malaria treatment at home but instead seek treatment at the health facility.

This is in contrast to the findings of the mentioned study in south-west Ethiopia where researchers found that mothers with a history of an under-five year old child who passed away were aware of the risk and severity of malaria and sought treatment at the health facility in time (Getahun et al 2010:1-5).

5.5.11 Influence of distance to the health facility as a problem on treatment at home before hospitalisation

The majority of mothers, namely 73.5% (n=75) reported that distance from the hospital was always a problem that they faced whenever a child had symptoms of malaria and
help was needed. This was sometimes a problem to 12.8% (n=13) of the mothers. For the sake of statistical data analysis these mothers were grouped together as mothers who mentioned that distance to the health facility was a problem.

Distance was one of the factors that were significantly associated with the use of drugs to treat malaria/fever at home: $x^2 = 6.222$, df=1, p=0.013, because those to whom distance was a problem could just get drugs from shops and other sources such as relatives to help the child with symptoms of malaria or fever. Transport to the health facilities is always a problem for most Malawian mothers especially those living in rural areas and difficult to reach areas.

5.5.12 Influence of money as a problem on treatment at home before hospitalisation

The majority of mothers, namely 69.6% (n=71) reported that money was one of the problems that affected treatment seeking behaviour whenever a child developed malaria/fever and treatment was required. Twenty point six percent (20.6%; n=21) of the mothers mentioned that money was "sometimes" a problem. These mothers 90.2% (n=92) were grouped together for data analysis purposes.

Mothers who reported that money was a problem were likely to administer treatment at home before consulting health care providers, compared to mothers who reported that money was not a problem: $x^2 = 5.516$, df=1, p=0.019. In Malawi, most health facilities are found in cities and towns making them difficult to access to 90% of the country’s population that live in rural areas. Most rural areas in Malawi have impassable roads during the rainy season (November to April) which also happens to be the malaria season. Mothers need transport money for themselves and the children with symptoms of malaria or fever to get treatment at district hospitals. Mothers who have inadequate money may find it cheaper to buy OTC drugs than travelling to health facilities.

5.5.13 Influence of the time it takes at the hospital to get treatment on malaria treatment at home before hospitalisation

In this study, mothers 41.2% (n=42) indicated that time it took to get treatment at the hospital was always a problem, while 29.4% (n=30) of them said that this was
“sometimes” a problem. These mothers were grouped together for statistical data analysis purposes. Time referred to time taken to get clinician’s prescription and drugs from the hospital pharmacy. Mothers who reported that it took long at the hospital to get treatment when a child had symptoms of malaria were more likely to administer treatment at home prior to clinician consultation than mothers who did not see this as a problem $x^2 = 5.831$, df=1, p=0.016. This shows that mothers’ previous experiences at the hospitals have impact on the use of health facilities.

5.6 RECOMMENDATIONS

5.6.1 Recommendations for public health practice

5.6.1.1 Improve mothers’ malaria knowledge

It seems as if public health care professionals should constantly work on improving malaria knowledge of mothers with small children. Radio enjoys a good listenership in all corners of Malawi and should be used to reach mothers of children under-five years old with malaria messages.

Mobile-phones are widely used even in rural areas of Malawi. This is another electronic device that can be utilised to improve mothers’ malaria knowledge and practices in children under-five years old.

Free primary education that was introduced in Malawi since the dawn of multiparty democracy in 1994 can be used to achieve universal access to malaria knowledge and good practices. Malaria as a disease should be covered in detail in the primary school curricula.

The health facilities and health workers have a crucial role to play in improving mothers’ malaria knowledge. They should aim at bringing the malaria knowledge to the communities in order to break the chain of malaria. Health care workers should introduce and strengthen malaria educational programmes at the health facilities. This will enable mothers understand malaria and promote early and appropriate health seeking behaviour.
5.6.1.2 Reduce poverty among women in the country

In order to win the fight against malaria there is need to reduce poverty among Malawian women and the whole population in general. There is a relationship between poverty and mothers’ treatment seeking behaviour regarding malaria in children under-five years old. Poor mothers delay in seeking treatment when a child has signs and symptoms of malaria. In addition, mothers with low economic status do not comply with recommended preventive measures of malaria such as the use of ITNs and prompt treatment because of affordability.

In terms of treatment and prevention of malaria, mothers employ a wide array of modern and traditional remedies and measures. Mothers with a sound knowledge of the causes and symptoms of malaria continue to use traditional treatments and only a few under-five children sleep under ITNs. Mothers in wealthier social strata frequently use ITNs and health facilities compared to poor mothers who use other protective measures that are perceived to be cheap.

Although state health facilities offer health services for free in Malawi, they are not accessible to the poor because well equipped health facilities are situated in urban and semi-urban areas. Cost of transport is the main factor which prevents the poorest of the poor from accessing and utilising them. Health providers should look towards community-based services that take ITNs and ACT to mothers in the communities to effectively scale up regular use aimed at protecting children under-five years old from malaria. Reducing or subsidising the costs of ITNs could also promote the use of this preventive measure.

Furthermore, malaria messages are in the newspapers, radios and television which are not always affordable to the poor who live in rural areas which do not even have electricity.

5.6.1.3 Research regarding technology

The malaria control programme and Thyolo district health management team should make an initiative to use new technology and evidence-based information to reduce malaria morbidity and mortality in children under-five years old. Main emphasis should
be on strengthening human and pharmaceutical resources for malaria management in all health facilities in the Thyolo district and the country in general and therefore research should be aimed at this.

Malawi national malaria management is based upon proper laboratory diagnosis and treatment of malaria episodes. Currently, ACT is available only in health facilities and it is given to patients with confirmed malaria. It is important to find ways to make ACT and RDT kits available in the shops. Mothers who live in hard to reach areas should be able to buy this recommended anti-malarial drug and malaria test kits. It is possible to teach mothers how to test under-five children for malaria parasites at home and use ACT to treat them. Emphasis should be made to give ACT only to children with confirmed malaria to avoid resistance.

5.6.2 Recommendations for further research

The researcher recommends that the following further research studies be done:

- This study can be carried out in other districts of Malawi to determine the knowledge, attitudes and practices of mothers on a national level regarding malaria in children under-five years old. This will enable the researchers to act on a national level and implement recommendations.
- Improvements can be made on the data collection instrument and then repeat the study in the Thyolo district to understand change of mothers’ knowledge, attitudes and practices over a period of time.
- A qualitative study could be done to explore factors related to malaria treatment-seeking behaviour of mothers of children under-five years old.
- An intervention study can be planned where mothers of children under-five years old in the Thyolo district could be provided with correct malaria information through health education. Thereafter, a study could be conducted to evaluate the effectiveness of the health education intervention campaign on mothers’ knowledge, attitudes and practices regarding malaria in children under-five years old.
5.7 LIMITATIONS OF THE STUDY

5.7.1 Context

Thyolo District Hospital is the only institution where the study took place. It would therefore be a problem to generalise the findings of this study to other districts of Malawi. It was context-specific to the culture and environment of Thyolo District.

This study was limited to mothers of children under the age of five years. Knowledge, attitudes and practices that may contribute to malaria-related mortality for other age groups were not the focus of this study.

The study was carried out at a state health facility in the Thyolo district. Private clinics in the district were not involved. The responses that could be expressed by respondents in the study might not be similar to those attending private institutions.

5.7.2 Sampling

Only cautious generalisations could be made due to the research setting and non-probability convenient sample. However, the mothers in this study might be representative of the Thyolo hospital attendees with regards to the characteristics that were examined in this research.

5.7.3 Data collection instrument

A limitation might also surface from the fact that a data collection tool was developed by a novice researcher. There could be possible unnoticed biases in the tool.

5.7.4 Ethics

Some of the items in the questionnaire could cause social and psychological discomfort because they required the mothers to disclose their personal issues. Therefore, it was possible that some respondents did not provide honest answers and this could affect the study findings.
5.8 REFLECTION ON THE STUDY

In this study on mothers’ knowledge, attitudes and practices regarding malaria in children under-five years old, the researcher experienced that mothers in the Thyolo district do not have enough knowledge about malaria. They perceive and manage the disease differently and in most cases incorrectly. There are several social, economic and demographic factors that have a bearing on the mothers’ knowledge, attitudes and practices regarding the disease.

The study also showed that Malaria Control Programme and the Malawi Ministry of Health have a huge task to promote mothers’ malaria knowledge and improve their treatment-seeking behaviour in order to reverse avoidable deaths of children under-five years old attributed to the disease. The study also revealed to the researcher that mothers competent with malaria knowledge can correctly manage their children with symptoms of malaria. Malaria information can be delivered to the mothers using appropriate media such as radio, posters and television.

5.9 CONCLUSION

This chapter presented a summary of study findings and the influence of mothers’ demographic-socioeconomic factors on their knowledge, attitudes and practices regarding malaria in children under-five years old as well as the limitations and recommendations.

This survey revealed that mothers of children under-five years old in the Thyolo district had inadequate information about malaria. There were also wrong attitudes and practices regarding malaria in under-five year old children that could contribute to malaria-attributable deaths in this age group. Most mothers were poor, uneducated and experienced a number of problems to access health care services when a child showed signs and symptoms of malaria.

Malaria related morbidity and mortality in children under-five years old in the Thyolo district could be prevented by doing the following:
• The poverty and illiteracy levels among women in the district should be reduced to improve malaria treatment-seeking behaviour.

• Education of mothers should include prevention and control of malaria.

• Improve health care delivery system by providing health facilities with enough material and human resources to effectively combat malaria.

This study revealed that there is still some work to be done in Malawi regarding mothers’ knowledge, attitudes and practices regarding malaria in children under-five years old. The recommendations made in this final chapter may help with this.
LIST OF REFERENCES


Chirdan, OO, Zoak, AI & Ejembi, CL. 2008. Impact of health education on home treatment and prevention


From: [http://www.malariajournal.com/content/9/1/7](http://www.malariajournal.com/content/9/1/7) (accessed 20 October 2012).


MSF see Medecins Sans Frontieres.


MOH see Ministry of Health.


Sivaramalingam, S. 2008. Surgical patients’ perceptions of nurses roles and responsibilities. ProQuest Dissertations and Theses. *ProQuest Nursing and Allied Health Sources*.


UNICEF see United Nations Children’s Fund.

From: [http://www.malariajournal.com/content/9/1/295](http://www.malariajournal.com/content/9/1/295) (accessed 10 May 2012).

WHO see World Health Organization.


ANNEXURE A: STUDY PERMISSION REQUEST LETTER

Enquiries: Prof ADH Botha
Tel: +2712429-8814
Fax: +27-12-429-4150
Email: bothaadh@unisa.ac.za
Department of Health Studies
University of South Africa
P.O. Box 52
UNISA
16 February 2013

The Principal Secretary
Ministry of Health
PO Box 30377
Lilongwe 3

Dear Sir

REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY

I am a registered student with the University of South Africa (UNISA), Department of Health Studies, for a Master’s degree in Public Health. My dissertation is entitled: Mothers’ knowledge, attitudes and practices on malaria in under-five children at Thyolo District Hospital, southern Malawi. The study will be conducted in partial fulfilment of the requirement for the award of the Master of Public Health (MPH) degree of the UNISA.

The purpose of the study is to investigate mothers’ knowledge, attitudes, and practices (treatment seeking-behaviours) that may play a role in malaria-attributable mortality in under-five children at the health facility level.

The study will involve a convenience sample of mothers of under-five children admitted to paediatric ward with a confirmed diagnosis of malaria. A structured questionnaire will be used to collect data in the children’s ward after obtaining informed consent.
I am seeking your approval of the study proposal. Attached are consent form, provisional questionnaire, and a copy of research proposal for your perusal.

Thank you in advance

Yours sincerely

HM PANCHI
Researcher/Student
Tel: +265-999-288-889/+265-882-640-495
Email: humphreypanchi@gmail.com
In reply please quote No. MED/4/36c

MINISTRY OF HEALTH
P.O. BOX 30377
LILONGWE 3
MALAWI

23rd December 2013

Humphrey Makalani Panchi
Malawi College of Health Sciences

Dear Sir/Madam,

Re: Protocol # 1239: Mothers' Knowledge, Attitudes and Practices on malaria in under five children at Thyolo District Hospital, Southern Malawi

Thank you for the above titled proposal that you submitted to the National Health Sciences Research Committee (NHSRC) for review. Please be advised that the NHSRC has reviewed and approved your application to conduct the above titled study.

- **APPROVAL NUMBER**: NHSRC # 1239
  - The above details should be used on all correspondence, consent forms and documents as appropriate.
- **APPROVAL DATE**: 23/12/2013
- **EXPIRATION DATE**: 23/12/2014
  - After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the NHSRC secretariat should be submitted one month before the expiration date for continuing review.
- **SERIOUS ADVERSE EVENT REPORTING**: All serious problems having to do with subject safety must be reported to the National Health Sciences Research Committee within 10 working days using standard forms obtainable from the NHSRC Secretariat.
- **MODIFICATIONS**: Prior NHSRC approval using standard forms obtainable from the NHSRC Secretariat is required before implementing any changes in the Protocol (including changes in the consent documents). You may not use any other consent documents besides those approved by the NHSRC.
- **TERMINATION OF STUDY**: On termination of a study, a report has to be submitted to the NHSRC using standard forms obtainable from the NHSRC Secretariat.
- **QUESTIONS**: Please contact the NHSRC on Telephone No. (01) 724418, 0888344443 or by e-mail on mohdoccentre@gmail.com
- **Other**: Please be reminded to send in copies of your final research results for our records as well as for the Health Research Database.

Kind regards from the NHSRC Secretariat.

FOR CHAIRMAN, NATIONAL HEALTH SCIENCES RESEARCH COMMITTEE

PROMOTING THE ETHICAL CONDUCT OF RESEARCH

Executive Committee: Dr C. Mwanambo (Chairman), Prof. E. Molyneux (Vice Chairperson)
Registered with the USA Office for Human Research Protections (OHRP) as an International IRB (IRB Number IRB00003905 FWA00005976)
UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

HSHDC/234/2013

Date: 9 October 2013  Student No: 4717-554-0

Project Title: Mothers' knowledge, attitudes and practices regarding malaria in under five year old children, at Thyolo District Hospital, Southern Malawi.

Researcher: Mr HM Panchi

Degree: Masters in Public Health  Code: DLMPH95

Supervisor: Prof ADH Botha
Qualification: D Cur
Joint Supervisor: -

DECISION OF COMMITTEE

Approved [✓]  Conditionally Approved [ ]

Prof L Roets
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

Prof MM Moleki
ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES
Dear Mother of a child with malaria in hospital:

I am pleased to invite you to be a participant in the above named study. The purpose of the study is to describe mothers’ knowledge, attitudes and practices regarding malaria in children under-five years old and make recommendations to improve treatment-seeking behaviour. The researcher will make recommendations based on the findings of this study that would improve the mothers’ knowledge, attitudes and treatment-seeking behaviour and ultimately reduce malaria-attributed under-five deaths in Thyolo district and Malawi in general.

The researcher would use an interview schedule to ask questions about malaria and its treatment/prevention. The interview would take less than 25 minutes. It would not cause any financial or psychological harm.

Your participation in this study is voluntary. You are free to withdraw at any time and the care of your child and your relationship with the health care workers at the hospital will not be jeopardised.

Anonymity and confidentiality will be maintained by assigning code names to the interviews rather than your real name. The collected data would not be shared with anyone without your consent and would be used for this study purpose only.
Although you may not directly benefit by participating in the study, the findings would influence recommendations and policies for malaria treatment and control to reduce malaria-related under-five deaths to achieve the Millennium Development Goals. Please, sign this form if you agree to participate.

This consent form has been read and explained to me. I fully understand the nature of the study for which I have been asked to participate. I have been assured that my rights of anonymity and confidentiality would not be violated.

Therefore, I hereby voluntarily give an informed consent to participate in the study.

Participant’s name...........................................................................................................

Participant’s signature..........................................................Date..................................

Researcher’s signature..........................................................Date.................................
CONSENT FORM

CHICHEWA VERSION

Mukupemphedwa kuti mutenge mbali pakafukufuku amene tikupanga kuti tidziwe zimene amayi amadziwa ndikuchita mwana wawo wosakwana zaka zisanu akadwala malungo. Komanso zifukwa zina zimene zimapangitsa kuti mwana amwalire ndi malungo pachipatala.

Opanga kafukufuku ameneyu azapanga m’fundo potengera zotsatira za kafukufukuyu kuti amai adziwe zambiri za malungo ndi zoyenera kuchita kuti tichepetse imfa ya ana osakwana zaka zisanu kuno ku Thyolo.

Opanga kafukufuku ameneyu akufunsani mafunso okhuzana ndi malango, kuchiza and kupewa kwake. Mafunso onse atenga nthawi yosapitilira mphindi makumi awiri and zisanu ndipo palibe chiopsyezo chilichonse pakatengedwe mbali yanu mukafukufuku ameneyu.


Ngakhale kuti phindu lakafukufuku ameneyu simungaliwone lero lomwe, zotsatira zakafukufuku ameneyu zidzatulutsa mfundo zothandiza kugonjetsa imfa za ana osakwana zaka zisanu zimene zimabwera chifukwa cha malungo. Chonde, sayinani ngati mwalola kutenga pali pakafukufuku wathu:
Ine ndamvetsa pempho lotenga mbali mukafufuku ameneyi. Ndamva bwino lomwe zonse zokhu kafukufuku ameneyi. Anditsimikizira kuti ufulu wanga ondisungira chinsinsi siuphwanyidwa.

Ine ndalola kutenga pali mukafufuku ameneyi.

Dzina la amai.................................................................

Siginitcha ya amai..............................................................Tsiku............................

Siginitcha ya ochita kafukufuku..............................Tsiku...........................
**ANNEXURE E: QUESTIONNAIRE**

Respondent's code: 

**1 SECTION 1: ECONOMIC-DEMOGRAPHIC CHARACTERISTICS**

1.1 In which age category do you fall? (tick one √)

<table>
<thead>
<tr>
<th>Age Category</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 years and below</td>
<td>(1.1.1)</td>
</tr>
<tr>
<td>20-29 years</td>
<td>(1.1.2)</td>
</tr>
<tr>
<td>30-39 years</td>
<td>(1.1.3)</td>
</tr>
<tr>
<td>40-49 years</td>
<td>(1.1.4)</td>
</tr>
<tr>
<td>50 years and above</td>
<td>(1.1.5)</td>
</tr>
</tbody>
</table>

1.2 What is your tribe? (tick one √)

<table>
<thead>
<tr>
<th>Tribe</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yao</td>
<td>(1.2.1)</td>
</tr>
<tr>
<td>Llomwe</td>
<td>(1.2.2)</td>
</tr>
<tr>
<td>Chewa</td>
<td>(1.2.3)</td>
</tr>
<tr>
<td>Ngoni</td>
<td>(1.2.4)</td>
</tr>
<tr>
<td>Tumbuka</td>
<td>(1.2.5)</td>
</tr>
<tr>
<td>Sena</td>
<td>(1.2.6)</td>
</tr>
<tr>
<td>Other: specify</td>
<td>(1.2.7)</td>
</tr>
</tbody>
</table>

1.3 What is your marital status? (tick one √)

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never married</td>
<td>(1.3.1)</td>
</tr>
<tr>
<td>Married</td>
<td>(1.3.2)</td>
</tr>
<tr>
<td>Divorced</td>
<td>(1.3.3)</td>
</tr>
<tr>
<td>Separated</td>
<td>(1.3.4)</td>
</tr>
<tr>
<td>Widowed</td>
<td>(1.3.5)</td>
</tr>
<tr>
<td>Co-habiting</td>
<td>(1.3.6)</td>
</tr>
<tr>
<td>Other: specify</td>
<td>(1.3.7)</td>
</tr>
</tbody>
</table>

1.4 What is the highest level of school you completed? (tick one √)

<table>
<thead>
<tr>
<th>Level of School</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never attended school</td>
<td>(1.4.1)</td>
</tr>
<tr>
<td>Did not complete primary school</td>
<td>(1.4.2)</td>
</tr>
<tr>
<td>Complete primary school</td>
<td>(1.4.3)</td>
</tr>
<tr>
<td>Did not complete secondary school</td>
<td>(1.4.4)</td>
</tr>
<tr>
<td>Completed secondary school</td>
<td>(1.4.5)</td>
</tr>
<tr>
<td>Did not complete college/university</td>
<td>(1.4.6)</td>
</tr>
<tr>
<td>Completed college/university</td>
<td>(1.4.7)</td>
</tr>
</tbody>
</table>
**1.5 What religion do you belong to? (tick one √)**

<table>
<thead>
<tr>
<th>Christian: Mark one directly below</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catholic (1.5.1)</td>
</tr>
<tr>
<td>Anglican (1.5.2)</td>
</tr>
<tr>
<td>Adventist (1.5.3)</td>
</tr>
<tr>
<td>CCAP (1.5.4)</td>
</tr>
<tr>
<td>Other Christian church: specify: (1.5.5)</td>
</tr>
<tr>
<td>Islam (1.5.6)</td>
</tr>
<tr>
<td>None (1.5.7)</td>
</tr>
<tr>
<td>Other religion: specify: (1.5.8)</td>
</tr>
</tbody>
</table>

**1.6 What has been your work status in the last 12 months?**

*Yes: I am working*

(please choose one option below)

<table>
<thead>
<tr>
<th>Government employee (1.6.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployed (1.6.4)</td>
</tr>
</tbody>
</table>

*No: I am not working*

(please choose a reason below)

<table>
<thead>
<tr>
<th>Non-government employee (1.6.2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student (1.6.5)</td>
</tr>
</tbody>
</table>

Self-employed (1.6.3) Retired (1.6.6)

**1.7 Over the last 12 months, can you tell me your average household earnings per month in Malawi kwacha? (tick one √)**

<table>
<thead>
<tr>
<th>K 0 - 9999 (1.7.1)</th>
<th>K10,000 - 14,999 (1.7.2)</th>
<th>K15,000 - 19,999 (1.7.3)</th>
<th>K20,000 - 24,999 (1.7.4)</th>
<th>K25,000 - 29,999 (1.7.5)</th>
<th>K30,000 - 34,999 (1.7.6)</th>
<th>K35,000 and more (1.7.7)</th>
</tr>
</thead>
</table>

**1.8 What type of a house do you come from? (Indicator: social economic status) (tick one √)**

*My house is made of:*

<table>
<thead>
<tr>
<th>poles and grass (1.8.1)</th>
<th>poles and grass (1.8.1)</th>
<th>burnt bricks and mud (1.8.3)</th>
<th>burnt bricks and cement (1.8.4)</th>
<th>other: specify (1.8.5)</th>
</tr>
</thead>
</table>
1.9 How many children do you have?

1.10 Did any of your children die? (tick one √)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>If yes: how many?</td>
<td></td>
</tr>
</tbody>
</table>

If you know the reason for the death of the child / children: please mention it:

1.11 Please answer the following questions about the child that is now in hospital:

<table>
<thead>
<tr>
<th>Age:</th>
<th>Gender:</th>
<th>Admission date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11.1</td>
<td>Male</td>
<td>1.11.3</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Why was the child admitted?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What was the duration of illness before hospitalisation? (tick one √)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 hours</td>
</tr>
<tr>
<td>1.11.5</td>
</tr>
</tbody>
</table>
1.12 Did you administer any treatment (mediation and other means) for the child’s condition before admission to hospital? (tick one √)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.12.2.</td>
<td>1.12.1</td>
</tr>
</tbody>
</table>

If yes, please mark all the options used or medications that you have given (tick all given √):

- 1.12.3 ACT
- 1.12.4 Panado (Paracetamol)
- 1.12.5 Quinine
- 1.12.6 Doxycycline
- 1.12.7 Aspirin
- 1.12.8 Traditional medicine
- 1.12.9 Religious healing
- 1.12.10 Other (specify)

1.13 Did the child sleep under a net (Insecticide treated net ITN) before admission to hospital? (tick one √)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

If yes: please indicate below: If no: please mark the reason/s below (√)

- Always
- Not all the time, but just sometimes

- Foul smell
- Unavailability
- Cost
- Fear of side effects
- Hot
- Other: specify
### 1.14 Did you do anything in your house (other than using a net) to prevent malaria before this child was admitted to hospital? (tick one √)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

If **yes**: please describe below what you did:

### SECTION 2: KNOWLEDGE, ATTITUDES AND PRACTICES

#### 2.1 Can the following be a cause of malaria/fever? (please tick yes / no √)

<table>
<thead>
<tr>
<th>2.1.1 Mosquito (Plasmodium)</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.2 Hot weather</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.1.3 Witchcraft/sorcery</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.1.4 Poor sanitation</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.1.5 Too much sunlight</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.1.6 Playing in the rain</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.1.7 Eating sour food</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.1.8 Eating cold food</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.1.9 Other (specify)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1.10 I do not know the cause of malaria:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 2.2 Can malaria (fever) be transmitted from one person to another in the following manner? (please tick yes / no √)

<table>
<thead>
<tr>
<th>2.2.1 Mosquito bites</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2.2 Placenta (from mother to baby)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.2.3 Human to human directly</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.2.4 Blood transfusion with malaria parasites in it</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.2.5 Stagnant water</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.2.6 The weather and the sun</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.2.7 Other (specify)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2.8 I do not know how malaria is transmitted</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3 The following people are at risk of contracting malaria/fever? (please tick yes / no √)

<table>
<thead>
<tr>
<th>2.3.1 People living with HIV/AIDS</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3.2 Under-five children</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.3.3 Pregnant women</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.3.4 Other (specify)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3.5 I do not know who are at risk of contracting malaria:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.4 The following are signs and symptoms of malaria/fever: (please tick yes / no √)

<table>
<thead>
<tr>
<th>2.4.1 Fever</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4.2 Headache</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.4.3 Convulsions</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2.4.4 Vomiting</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
2.4.5 Nausea | Yes | No
---|---|---
2.4.6 Anorexia (not feeling hungry or wanting to eat) | Yes | No
2.4.7 Joint pains | Yes | No
2.4.8 Anaemia (a lack of red blood cells) | Yes | No
2.4.9 Other (specify) |
2.4.10 I do not know any signs or symptoms of malaria:

### 2.5 In your opinion, can Malaria be treated? (tick one √)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

2.5.1 If yes, please mark all (√) the options or medications that you believe can be used:

- 2.5.3 ACT
- 2.5.4 Panado (Paracetamol)
- 2.5.5 Quinine
- 2.5.6 Doxycycline
- 2.5.7 Aspirin
- 2.5.8 Traditional medicine
- 2.5.9 Religious healing
- 2.5.10 Other (specify)

### 2.6 Mosquitoes breed in the following places (please tick yes / no √)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

2.6.1 Stagnant water
2.6.2 Places where there is poor hygiene
2.6.3 Close to rivers
2.6.4 Other (specify)
2.6.5 I do not know where mosquitoes breed
### 2.7 Do you believe that malaria can be prevented?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.8 Do you think the following can be used to prevent malaria?

<table>
<thead>
<tr>
<th></th>
<th>It always works well</th>
<th>It sometimes work</th>
<th>It does not work at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.8.1 Insecticide treated bed nets (ITN's)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.2 Indoor residual spray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.3 Prompt treatment when any symptoms of malaria are seen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.4 Coils</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.5 Repellents like sprays or cream that is rubbed on</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.6 Good personal hygiene</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.7 Eating healthy food</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.8 Drainage of sites (permanent wet areas) where mosquitoes may be able to breed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.9 Burn cow dung or leaves in the house</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.10 Blockage of holes where mosquitoes may enter the house</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.11 Keeping doors and windows closed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.12 Killing mosquitoes when they are seen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.13 Use of medication to prevent malaria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8.14 Intermittent presumptive treatment (IPTp)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 2.9 I get information about malaria from the following sources (please tick yes / no √)

<table>
<thead>
<tr>
<th>Source</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.9.1 Husband</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9.2 Other family members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9.3 Friends</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9.4 Health workers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9.5 Radio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9.6 Television</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9.7 Posters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9.8 Information leaflets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9.9 Other (specify)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9.10 I do not get any information about malaria whatsoever:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.10 The following are problems when you think a child is ill with malaria and help is needed

<table>
<thead>
<tr>
<th>Problem</th>
<th>It is always a problem</th>
<th>It is sometimes a problem</th>
<th>It is not a problem at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.10.1 The distance from the hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.10.2 Money</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.10.3 The time it takes at the hospital to get treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.10.4 If there are other problems, please mention:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.11 The following are reasons why I seek malaria treatment for my child at a health facility (please tick yes / no √)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12.11.1 TV programmes on malaria</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>2.11.2 Radio programmes on malaria</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>2.11.3 Advice from my friends</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>2.11.4 Advice from family members</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>2.11.5 Death of a child due to malaria (my own, family member or friend’s)</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>2.11.6 Health education at health facility</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>2.11.7 Posters at health facility</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>2.11.8 Advice from health workers</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>2.11.9 Other reasons: please mention</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What is there about the disease Malaria that you would like to know?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Thank you for your participation
QUESTIONNAIRE
CHICHEWA VERSION

Nambala ya oyankha mafunso.................................................................

1 GAWO 1: CHUMA-KUMUDZIWA OFUNSIDWA

1.1 Muli ndi zaka zingati? (sankhani chimodzi✓)
Zaka 19 kapena kuchepera apo (1.1.1) Zaka 20-29 (1.1.2)
Zaka 30-39 (1.1.3) Zaka 40-49 (1.1.4) Zaka 50 kapena kuposa (1.1.5)

1.2 Ndinu a mtundu wanji wa anthu? (sankhani chimodzi)
Ayao (1.2.1) Allomwe (1.2.2) Achewa (1.2.3) Angoni (1.2.4) Atumbuka (1.2.5)
Asena (1.2.6) Mtundu wina: Tchulani (1.2.7)

1.3 Kodi muli pa banja? (sankhani chimodzi✓)
Sindinakhalepo pa banja (1.3.1) Ndili pa banja (1.3.2) Banja linatha (1.3.3)
Tidanyanyalitsana (1.3.4) Amuna anga adamwalira (1.3.5)
Ndimakhala ndi mamuna koma sitinakwatirane (1.3.6) Zina: tchulani (1.3.7)

1.4 Kodi maphunziro munalekeza pati (sankhani chimodzi)
Osaphunzira (1.4.1) Sanamalize school ya pulaimale
Adamaliza sukuulu ya pulaimale (1.2.3) Sanamalize sukuulu yakusekondale (1.4.4)
Anamaliza sukuulu ya sekondale (1.4.5) Sanamalize maphunziro a ukachenjede (1.4.6)
Anamaliza maphunziro a ukachenjede (1.4.7)

1.5 Kodi ndinu a mpingo wanji? (sankhani umodzi ✓)
Chikhirisitu: (sankhani umodzi pansipa✓)
Katolika (1.5.1) Angilikani (1.5.2) Adventisiti (1.5.3) aCCAP (1.5.4)
Mpingo wina wachikhirisitu: tchulani (1.5.5) Achisilamu (1.5.6)
Ndilibe mpingo(1.5.7) Mpingo wina: tchulani (1.5.8)
1.6 Kodi miyezi khumi ndi iwiri yapitayi mwagwira ntchito yanji? (sankhani chimodzi✓)

Inde: ndikugwira ntchito (chonde, sankhani chimodzi)

Ayi: sindigwira ntchito (chonde sankhani chimodzi)

Ndimagwirara ntchito ya boma (1.6.1)  Ndimagwira ntchito koma siyaboma (1.6.2)

Sindimagwira ntchito (1.6.3) Ndimagwira nchito zanga (1.6.4) Ndine mwana wasukulu (1.6.5) Ndinapuma ntchito (1.6.6)

1.7 M’miyezi khumi ndi iwiri yapitayi, ndiuzeni ndalama zomwe mumapanga pamwezi (sankhani chimodzi✓)

K 0-9999 (1.7.1) K10,000-14,999 (1.7.2) K15,000-19,999 (1.7.3) K20,000-24,999(1.7.4)
K25,000-29,999 (1.7.5) K30,000-34,999 (1.7.6) K35,000 kapena kuposera pamenepe (1.7.7).

1.8 Nyumba yanu ndi ya mtundu wanji? (ichi ndi chisonyezo cha chuma cha munthu)

Nyumba yanga ndi yopanga ndi (sankhani chimodzi✓)

Mitengo ndi udzu (1.8.1) Njerwa zosaotcha (1.8.2) Njerwa ndi matope (1.8.3)
Njerwa zootcha ndi simenti (1.8.4) Mtundu wina wa nyumba (1.8.)

1.9 Muli ndi ana angati?

1.10 Kodi muli ndi ana oti anamwalira? (sankhani chimodzi✓)

Inde  Ayi

Ngati inde: angati?

Ngati mukudziwa chomwe chinapha mwana wanu/ana anu: tiuzeni:

1.11 Chonde yankhani mafunso awa okhuza mwana wanu amene wagonekedwa m’chipatala:

zaka(1.11.1) Mamuna kapena mkazi (1.11.2) Anagonekedwa liti (1.11.3)
Anagonekedwa chifukwa chiyani (1.11.4)
Kodi wadwala masiku angati asanagonekedwe m’chipatala
Maola makumi awiri ndi maola anayi (1.11.5)
Maola makumi anayi ndi maola asanu ndi atatu
Maola makumi asanu ndi awiri ndi maola awiri
Kupitirira maola makumi asanu ndi awiri ndi maola awiri

1.12 Kodi mwanayu munampatsa mankhwala asanagonekedwe kuchipatala kuno (sankhani chimodzi)

Inde (1.12.2) Ayi (1.12.1)
Ngati inde, tiuzeni mankwala omwe aperekedwa kwa mwana (mutha kusankha zonse)
1.12.3 ACT 1.12.4 Panado 1.12.5 kwinini 1.12.6 Dokisesayikilini 1.12.7 Asipirini
1.12.8 mankhwala achikuda 1.12.9 Mapemphero 1.12.10 Ena: (thulani)

1.13 Kodi mwanayu amagona muneti ya udzuzu asanagonekedwe m’chipatala (sankhani chimodzi)

Inde Ayi
Ngati inde: tiuzeni pansipa Nthawi zonse Sinthawi zones, koma nthawi ina
Ngati ayi: chonde, tiuzeni chifukwa/zifukwa pansipa
Kununkha (1.13.1) Kusowa kwa maneti (1.13.2) Kukwera mtengo (1.13.3)
Kuopa zoipa zomwe zimabwera ndi neti (1.13.4) kutentha (1.13.5)
Zifukwa zina: tchulani

1.14 Kodi munachita china chilichonse kunyumba (kupatula kugwiritsa ntchito neti) kuti mupewe malungo mwanayu asanagonekedwa m’chipatala?

Inde Ayi
Ngati inde: chonde tiuzeni zomwe munachita:

2 GAWO 2: KUZINDIKIRA, KHALIDWE ANDI ZOCHITA

2.1 Kodi izi zitha kuyambitsa malungo/kutentha thupi? (chonde sankhani inde/ayi)

2.1.1 Udzuzu Inde Ayi
Nyengo yotentha Inde Ayi
2.1.3 Ufiti inde Ayi
2.1.4Umve/uchisi Inde Ayi
2.1.5 Dzuwa lambiri     inde     ayi
2.1.6 Kusewera pa mvula  Inde     Ayi
2.1.7 Kudya chakudya chosasa  Inde     Ayi
2.1.8 Kudya chakudya chozizira Inde     Ayi
2.1.9 zina: (tchulani)
2.1.10 Sindidiwa chimene chimayambitsa malungo/kutentha thupi

2.2 Kodi malungo (kutentha thupi) kumafala munjira izi? (sankhani inde/aiy√)
2.2.1 Kulumidwa ndi udzuzu     Inde     Ayi
2.2.2 kuchokera kwa mayi kupita kwa mwana asanabadwe  Inde     Ayi
2.2.3 kuchokera kwa munthu wina     Inde     Ayi
2.2.4 Kulandira magazi amene ali ndi tizilombo tamalungo  Inde     Ayi
2.2.5 Madzi osayende     Inde     Ayi
2.2.6 Nyengo ndi dzuwa     Inde     Ayi
2.2.7 Zina (tchulani)
2.2.8 Ine sindikudziwa momwe malungo amafalira

2.3 Anthu awa ali pachiopsyezo cha malungo/kutentha thupi? (sankhani inde/aiy√)
2.3.1 Anthu amene ali ndi HIV/AIDS     Inde     Ayi
2.3.2 Ana osapitilira zaka zisanu     Inde     Ayi
2.3.3 Azimayi apakati     Inde     Ayi
2.3.4 Ena (tchulani)
2.3.5 Ine sindikudziwa anthu amene ali pachiopsyezo cha malungo

2.4 Izi ndi zizindikiro za malungo/kutentha thupi (sankhani inde/aiy)
2.4.1 Kutentha thupi     Inde     Ayi
2.4.2 Litsipa/kuwawa mutu     Inde     Ayi
2.4.2 Kukomoka     Inde     Ayi
2.4.3 kuchepa kwa magazi     Inde     Ayi
2.4.4 Kusanza     Inde     Ayi
2.4.5 Nselu
Inde
Ayi
2.4.6 Kusafuna kudya
Inde
Ayi
2.4.7 kupweteka mokumanirana mafupa
Inde
Ayi
2.4.8 Zina (tchulani)

2.4.9 Ine sindidziwa zizindikiro za malungo:

2.5 M'maganizo anu, kodi malungo angachizidwe? (sankhani chimodzi)
No (2.5.1).
Ngati inde, sankhani mankhwala amene angagwiritsidwe ntchito:
2.5.3 ACT  2.5.4 Panado  2.5.5 kwinini  2.5.6 Dokisesayikilini  2.5.7 Asipirini
2.5.8 Mankhwala achikuda  2.5.9 Mapemphero  2.5.10 Ena (tchulani)

2.6 Udzuzu umaswana malo ngati awa (sankhani inde/yaAy)

2.6.1 Madzi osayenda
Inde
Ayi
2.6.2 Malo opanda ukhondo
inde
Ayi
2.6.3 Pafupi ndi mitsinje
Inde
Ayi
2.6.4 Ena (tchulani)

2.6.5 Sindikudziwa malo omwe udzuzu umaswana

2.7 Kodi mumakhulupirira kuti malungo angapewedwe?
Inde
Ayi

2.8 Kodi izi zingagwiritsidwe ntchito popewa malungo?
chimathandiza
Nthawi ina chimathandiza

Sichimathandiza
2.8.1 Net yonyikidwa m’mankhwala  2.8.2 Kupopera mankhwala m’nyumba
2.8.3 Kulandira mankhwala amalunga mwachangu tikadwala
2.8.4 Makoilo  2.8.5 Mafuta odzola pa khungu  2.8.6 Kusamalira thupi
2.8.7 Kudya chakudya chaukhondo
2.8.8 Kuchotsa zithaphwi momwe udzuzu ungamaswane
2.8.9 kuotcha ndowe kapena masamba m’nyumba
2.8.10 Kutseka mabowo amene udzuzu ungalowere m’nyumba
2.8.11 Kutseka zitseko ndi mawindo  2.8.12 Kupha udzuzu ukaoneka
2.8.13 Kumwa mankhwala kuti tipewe malungo
2.8.14 Kumwa mankhwala amalungo amai akakhala ndi pakati

2.9.1 Uthenga wa malungo ndimaupeza kuchokera kwa: (sankhani inde/ayi)

<table>
<thead>
<tr>
<th>2.9.1</th>
<th>Amuna anga</th>
<th>Inde</th>
<th>Ayi</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.9.1</td>
<td>Abale</td>
<td>Inde</td>
<td>Ayi</td>
</tr>
<tr>
<td>2.9.3</td>
<td>Anzanga</td>
<td>Inde</td>
<td>Ayi</td>
</tr>
<tr>
<td>2.9.4</td>
<td>Achipatala</td>
<td>Inde</td>
<td>Ayi</td>
</tr>
<tr>
<td>2.9.5</td>
<td>Wailesi ya kanema</td>
<td>Inde</td>
<td>Ayi</td>
</tr>
<tr>
<td>2.9.6</td>
<td>Wailesi</td>
<td>Inde</td>
<td>Ayi</td>
</tr>
<tr>
<td>2.9.7</td>
<td>Zithunzi</td>
<td>Inde</td>
<td>Ayi</td>
</tr>
<tr>
<td>2.9.8</td>
<td>Uthenga olembedwa pa pepala</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9.9</td>
<td>Zina (tchulani)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9.10</td>
<td>Ine sindikudziwa uthenga ulionse wa malunga</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.10 Awa ndi mabvuto amene ndimakumana nazo mwana akafuna thandizo la matenda a malungo

Nthawi zones ndi bvuto
Nthawi zina ndi bvuto
Sibvuto kwa ine

<table>
<thead>
<tr>
<th>2.10.1</th>
<th>Mtunda opita kuchipatala</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.10.2</td>
<td>Ndalama</td>
</tr>
<tr>
<td>2.10.3</td>
<td>Nthawi imene imatenga kuti achipatala akuthandize</td>
</tr>
<tr>
<td>2.10.4</td>
<td>Ngati pali mabvuto ena, tiuzeni</td>
</tr>
</tbody>
</table>

2.11 Izi ndi zifukwa zimene ndimatengera mwana wanga kuchipatala kuti akalandire mankhwala a malungo (sankhani inde/ayi).

<table>
<thead>
<tr>
<th>2.11.1</th>
<th>Mapologalamu a malungo pa wailesi ya kanema</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.11.2</td>
<td>Mapologalamu a malungo pa wailesi</td>
</tr>
<tr>
<td>2.11.3</td>
<td>Ulangizi kuchokera kwa anzanga</td>
</tr>
<tr>
<td>2.11.4</td>
<td>Ulangizi kuchokera kwa abale</td>
</tr>
</tbody>
</table>
2.11.5 Kumwalira kwa mwana chifukwa cha malungo (wanga, wachibale, wanzanga)  
Inde    Ayi

2.11.6 Maphunziro a zaumoyo kuchipatala  
Inde    Ayi

2.11.7 Zithunzi za kuchipatala  
Inde    Ayi

2.11.8 Malangizo kuchokera kwa a zaumoyo  
Inde    Ayi

2.11.9 Zifukwa zina: chonde tchulani

Pali china chilichonse chokhuza matenda a malungo chomwe mungafune kudziwa?

Zikomo potenga pali pakafukufuku wathu
## ANNEXURE F: TIME FRAME

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<thead>
<tr>
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<td>Report finalisation</td>
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<tr>
<td>Report review by the supervisor and the researcher</td>
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</table>
## ANNEXURE G: BUDGET

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Cost per item in Malawi kwacha (MK)</th>
<th>Total cost (Mk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration fees</td>
<td>2 years</td>
<td>231,200 per year</td>
<td>462,400</td>
</tr>
<tr>
<td>Computer (laptop)</td>
<td>1</td>
<td>200,000</td>
<td>200,000</td>
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<tr>
<td>Printer</td>
<td>1</td>
<td>40,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Ink</td>
<td>2</td>
<td>10,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Reams of paper</td>
<td>4</td>
<td>800</td>
<td>3,200</td>
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<tr>
<td>Flat folder</td>
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<td>200</td>
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<tr>
<td>Pens</td>
<td>10</td>
<td>100</td>
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<td>pencils</td>
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<td>Lever arch file</td>
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<td>500</td>
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<td>Stapler/pins</td>
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<td>1500</td>
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<td>Flash disk</td>
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<tr>
<td>erasers</td>
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<td>1000</td>
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<td>Typist</td>
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<td>Photocopying of questionnaires</td>
<td>600 pages</td>
<td>15/page</td>
<td>9,000</td>
</tr>
<tr>
<td>Training and allowance for</td>
<td>2</td>
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<tr>
<td>research assistants</td>
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<tr>
<td>Telephone charges</td>
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<tr>
<td>Internet charges</td>
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<td>15,000</td>
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<tr>
<td>Transport expenses</td>
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</tr>
<tr>
<td>Statistician services</td>
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<td>15,000</td>
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<tr>
<td>Photocopying and binding</td>
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<td>Photocopying and binding</td>
<td>6 final copies</td>
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<td>CD-ROM</td>
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<td>Data clerk allowance</td>
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</tr>
<tr>
<td><strong>Grand total</strong></td>
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<td></td>
<td><strong>936,850</strong></td>
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</tbody>
</table>