ASSESSMENT OF COMMUNITY KNOWLEDGE AND PREVENTION PRACTICES OF MALARIA IN MUTALE MUNICIPALITY, VHEMBE DISTRICT.

BY

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Declaration

I, Munyai Livhuwani hereby declare that the content in this Mini -Dissertation titled: "**Assessment of community knowledge and prevention practices of malaria at Masisi Village in Mutale Municipality, Vhembe District" is** my own work, and has never been done or presented in any university before. All sources that I have used in this study have been fully acknowledged.

Signature:

Date: 28 February 2019

Abstract

Background: Malaria is a public health issue killing more than 435 000 people in Sub Saharan Africa. In South Africa, malaria is endemic in 3 provinces namely: Limpopo, Mpumalanga and Kwazulu Natal. Limpopo Province contributes more cases than the other provinces in the country. **Purpose:** The purpose of the study was to assess community knowledge and prevention practices of malaria at Masisi village, in Mutale Municipality, Vhembe District. The study was conducted at Mutale municipality, Vhembe District.

Methodology: A quantitative cross-sectional descriptive approach was used. Data was collected using a questionnaire with open and close ended questions. The targeted population was made up of males and females between the ages of 18 to 75. Validity and reliability have been ensured in the study and the results for reliability were 0.85. Pretesting was done in 5 household at Sanari village which is near Masisi village as they share the same characteristics. A sample of 152 participants was selected from the target population by means of systematic sampling and then select them randomly. Questionnaires were used to collect data. There after Data were analyzed using SPSS version 24.0. The analyzed data were presented in tables, graphs, and in percentages.

Results: The findings revealed that majority of the participants 103(67.8%) have secondary education, and most of them, 103(67.8%) are unemployed. The study revealed that about 77% have knowledge regarding malaria transmission. About 130(85.5%) indicated that malaria is caused by a mosquito bite. About 57(38.51%) indicated that they use mosquito coils and nets in their household.

Conclusion: Malaria still poses a threat to the lives of people living in malaria endemic areas. Community members at Masisi village have better insight regarding malaria transmission, causes and signs and symptoms. Although the community shows a better understanding of the prevention method they still has to put this into practice in order to eliminate malaria in the area. Health workers are doing a great job in educating the community regarding malaria related issues.

Key words: **community, knowledge of malaria, prevention practices of malaria**.

DEDICATION

I dedicate this mini- dissertation to my guardian angel, my late mother. A courageous woman who never set her foot in the classroom but perceived education as the key to success. Thank you for sacrificing your life so that we can have quality education as your children's. You are my heroine and I salute you for spending your entire life being a hawker for the sake of our education. Your prayers kept me going. You're gone but will never be forgotten. Today I stand a proud young woman because of you. Thank you Mom. May your lovely soul rest in eternal peace.

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I would like to thank God for being there for me in my entire life. Indeed your plans are greater than my plans. Without God I wouldn't have achieved this.

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- To my supportive husband, Humbulani Lithole.
- A big thank you goes to my research participants, without your participation this mini-dissertation would not have been a success.

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LIST OF ACRONYMS

AIDS:	**Acquired immune deficiency virus**
CDC:	**Centre for disease control**
DDT:	**Dichloro-diphenyltrichlorone**
HIV:	**Human immunodeficiency virus**
IRS:	**Indoor residual spraying**
KAP:	**knowledge attitude and practice**
MCP:	**Malaria control programme**
MRC:	**Malaria research council**
MESP:	**Malaria elimination strategic plan**
SANDOH:	**South African national department of health**
WHO:	**World health organization**

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CHAPTER ONE

1.1: INTRODUCTION AND BACKGROUND TO THE STUDY

Malaria is a global public health issue particularly in sub Saharan Africa during summer and autumn seasons. Approximately 219 million new cases occurred in 2017 with an estimate of 435 000 deaths worldwide (WHO 2018). The WHO African region reported about 200 million cases in 2017. It is more prevalent in sub Saharan Africa and carries a high global rate of 90% malaria cases and 92% malaria deaths (WHO, 2016). South Africa is also experiencing this public health issue.

In 2017, Sub-Saharan Africa and India contributed almost 80% of global malaria cases. Although there's a decline in the incidence rate between 2010(239 million) and 2017(219 million), malaria still poses a threat in the lives of people living in Sub-Saharan Africa (WHO, 2018).

Malaria incidence rate remained at 219 cases per 1000 population risk in sub-Saharan Africa. About 435 000 deaths were reported in 2017. Children under the age of 5 years accounted for almost 61% of malaria death globally and 93% were from sub-Saharan Africa (WHO, 2018)

Nigeria contributed about 25% of the cases and 19% of deaths, followed by the Democratic republic of Congo with 11% of cases and 11% of malaria deaths (WHO, 2018). South Africa is also experiencing this public health issue.

Malaria is caused by four different species that are as follows: Plasmodium falciparum, plasmodium malaria, and plasmodium ovale and plasmodium vivax. In Sub-Saharan Africa the most dangerous species is Plasmodium falciparum accounting for 99.7% of the global malaria cases in 2017. Plasmodium vivax is the mostly common in the WHO region of the Americans accounting for 74.1% of malaria cases (WHO 2018).

The anopheles Funestus and Anopheles Arabies are the primary vectors of malaria, centre for disease control (CDC, 2014). This type of mosquitoes (anopheles) breeds in water. Approximately 95% of malaria infections found in South Africa result from a parasite Plasmodium falciparum, with the mosquito Anopheles arabinoses being a major malaria vector (SADOH, 2007).

Malaria is transmitted through the bite of an infected female anopheles mosquito which bite between dusk and dawn. The most commonly signs and symptoms of Malaria are fever, chills, headache, muscular aching and weakness, vomiting, diarrhea and abdominal pains (WHO 2018).

Malaria is more common in young children under 5 years, pregnant women, elderly people and people who are immunocompromised (WHO 2018). In Sub-Saharan Africa, malaria is diagnosed using a malaria rapid test as it detects plasmodium falciparum faster (WHO 2015). In 2017 almost 75% of malaria were diagnosed using a rapid test in public health facilities in Sub-Saharan Africa (WHO 2018).

In South Africa Malaria prevalence is high in 3 provinces which are: Limpopo, Mpumalanga and KwaZulu-Natal. These 3 provinces are along the borders of Zimbabwe, Mozambique and Swaziland. Malaria is considered as seasonal and unstable (SADOH 2007), with transmission limited to warm and rainy summer months from September to May (Mgabisa, 2013)".

The Incidence of malaria cases was estimated at 20 cases per 100,000 population in 2015 (Manana 2017). More or less than 10% of the population resides in malaria endemic areas and is at risk of contracting the disease (Mgabisa, 2013).

According to Hlongwane (2013) South Africa reported an estimated 11 705 confirmed cases in 2013 and an estimated 174 deaths." The burden of malaria has been contributed mostly by the Limpopo province, accounting for most cases in 2010. (Raman, Morris, Frean, Brooke, Blumberg, Kruger, Mabusa, Raswiswi, Shandukani, Misani, Groepe, &Moonasar, 2016)". Limpopo province has five malaria endemic municipal districts, namely Capricorn, Greater Sekhukhune, Mopani, Vhembe and Waterberg. Among the 5 endemic districts of Limpopo province, Vhembe is the highest burdened district. (Raman *et al*., 2016). About 60 % of the national malaria cases were reported from Vhembe district which is considered to be in the control phase of the elimination process.

In South Africa malaria control programme focuses on vector control and case management. Vector control is achieved through indoor residual spraying of houses. Dicloro-diphenyl-trichloethane(DDT) and the pyrethoid deltamethrin are the insecticides currently used to eliminate malaria in South Africa (Maharaj 2013).

1.2. Problem statement

Malaria is an endemic problem in Limpopo province especially in rural areas at Vhembe District with Mutale municipality as the highest contributor. Despite the national strategy of malaria prevention through indoor residual spraying of houses, malaria still remains a major problem at Mutale Municipality. Although South Africa has moved from control to elimination, malaria still causes a threat in the lives of people living in Mutale municipality. Most rural areas including Masisi village are near the Limpopo River that separate South Africa and Zimbabwe. Also nearer to the Mutale River and the Phafuri gate of Kruger national park. Due to shortage of water most people bath and do laundry at Mutale River where mosquitoes normally breed. The researcher is currently employed as a professional nurse at Mulala Clinic under Mutale Municipality and has observed that there's a high rate of malaria infection among community members at Mutale Municipality. According to health workers from Mulala and Masisi clinic, most people present with signs and symptoms of malaria at a later stage and this result in further referral to hospital for management (Masisi and Mulala clinic record, 2015).

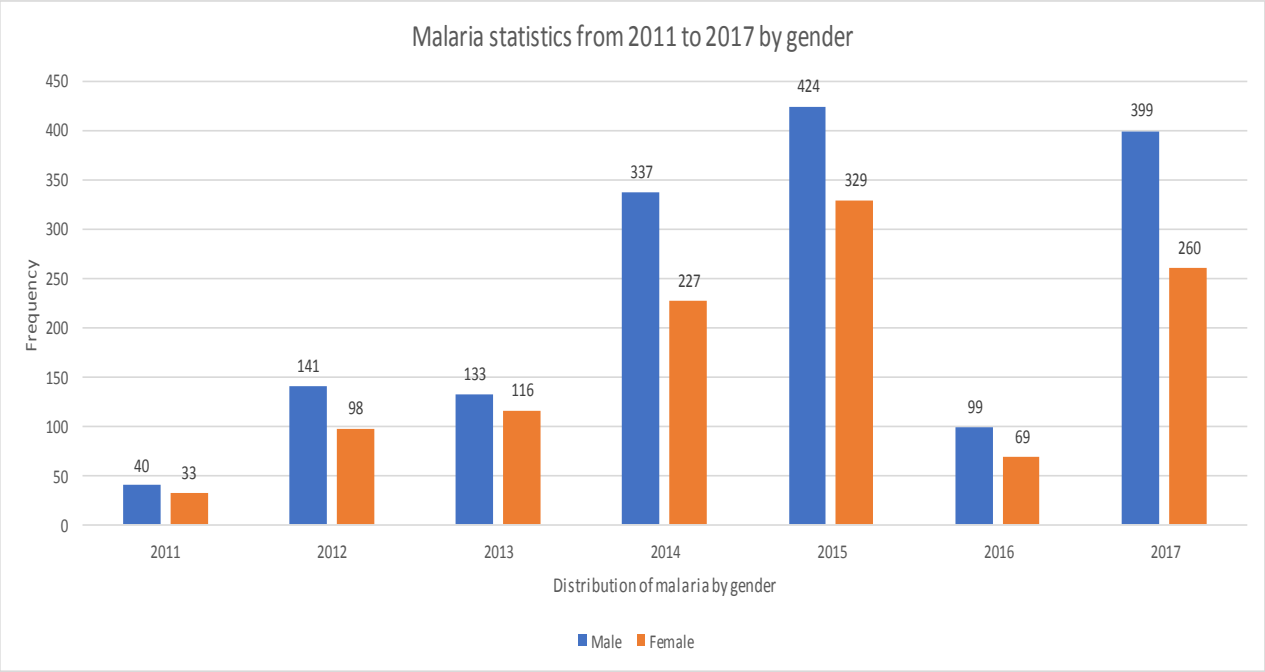

Figure 1: Malaria statistics Source: Limpopo malaria unit (Makuya/Masisi sub area)

The statistics displayed in figure 1 have prompted the researcher to assess the knowledge and prevention practices regarding malaria at Mutale Municipality.

1.3 Rationale of the study

Several studies have been conducted at Mutale Municipality regarding malaria but no known study has focused on assessment of community knowledge and prevention practices of malaria at Masisi village, Mutale Municipality, Vhembe District. For instance Radali (2013) focused on the continuous recurrence of malaria transmission at Tshivaloni village. Brooks and Abney (2013) focused on the perceptions of malaria in Limpopo Province of South Africa at Ha Makuya village. The researcher then saw the need for conducting the research on community knowledge and prevention practices of malaria at Masisi village, at Mutale Municipality, Vhembe District

1.4 Significance of the study

The results of this study may assist the Department of Health in strengthening malaria strategic plan on control and elimination of malaria in Limpopo Province. Findings from the study may assist the municipality in developing or implementing new strategic plans and allocating enough budgets. The study results may also assist the Department of Health in reduction of mortality and morbidity rate caused by malaria in Limpopo Province.

1.5 Purpose of the study

The purpose of the study was to assess community knowledge and prevention practices of malaria at Mutale Municipality, Vhembe District Municipality in Limpopo Province.

1.6. Objectives of the study

The objectives of the study were to:

1.6.1. Assess the level of knowledge of malaria among community members at Mutale Municipality.

1.6.2. Describe malaria prevention practices by community members at Mutale Municipality.

1.7 Conceptual Framework

This study was based on the knowledge, attitude and practice(KAP) model which aims on providing information on what is already known, believed and done in relation to a particular topic e.g. (malaria). KAP survey gathers information about what respondents know about malaria, what they think about the health system response to malaria, knowledge regarding the cause, mode of transmission, signs and symptoms and what they actually do with regard to seeking care or taking other action related to malaria. KAP surveys can identify knowledge gaps, cultural beliefs, or behavioral patterns that may facilitate understanding and action, as well as pose problems or create barriers for malaria control effort (WHO 2008). KAP surveys may be used to identify needs and barriers in provision of service deliver. It also addresses the problem by giving solutions for improving quality of care (WHO, 2008).

In this study knowledge is important in malaria as what is known can easily be practiced. If a person has enough knowledge regarding malaria there will be a reduction in mortality rate caused by malaria. Knowledge regarding the prevention practice will enable the community or an individual to practice the correct preventive measures in his/her household and the community as a whole. This model (KAP) may assist in identifying gaps, challenges within healthcare provision and how to overcome them. Variables such as age, gender, educational level are linked to knowledge and prevention practices regarding malaria. Several studies that have been conducted before revealed that community knowledge regarding malaria leads to reduction in new cases and therefore eradicates malaria. (Hlongwane *et.al,* 2009).

1.8 Definitions of key concepts

1.8.1 Community

A group of people having cultural, religious, ethnic or other characteristics in common and living in one locality (Collins 2000).For the purpose of this study community refers to a group of people, both males and females living at Mutale Municipality, Vhembe district.

1.8.2 Knowledge of Malaria

Oxford Dictionary defines knowledge as facts, information and skills acquired through experience or education; the theoretical or practical understanding of a subject. For the purpose of this study knowledge refers to information about malaria whether theoretical or practical.

1.8.3 Prevention practices

Oxford Dictionary defined prevention as the action of stopping something from happening and practices is defined as the actual application or use of an idea, belief or method, as opposed to theories relating to it (Oxford 2014). However in this study malaria prevention practices focus on activities or action taken by community members of Masisi village at household level in reducing malaria occurrence and transmission.

1.8.4. Malaria

According to Merriam Webster malaria is a human disease caused by protozoan parasite mainly the plasmodium, in the red blood cells, and is transmitted by the bite of anopheles mosquitoes and is characterized by periodic attacks of chills and fever. In this study malaria refers to an infectious diseases characterized by fever, chills and headache, that is proven scientifically using a rapid test.

1.9 outline of the study

The study is divided into 6 chapters that are as follows

Chapter 1: Provides the introduction and background of the study. This covers the impact of malaria World wide

Chapter 2: Is the literature to support the study. This includes signs and symptoms of malaria, causes of malaria, how malaria is transmitted, where and when to seek medical attention when suspecting malaria. Knowledge of malaria treatment and the prevention practices of malaria.

Chapter 3: Shows the steps that was followed during data collection, sampling method, and instrument used to collect data and how the collected data was analyzed.

Chapter 4: This chapter includes the findings of the study after analysis. The results are presented in tables and graphs and they appear in percentage.

Chapter 5: Discussion of the study. This chapter focuses on the findings of the study in comparison with other studies conducted elsewhere. Discussion is done based on the main themes of the study. This includes demographic information, knowledge about malaria and prevention practices of malaria.

Chapter 6: Gives the summary of the study, recommendations and conclusion.

CHAPTER 2. LITERATURE REVIEW

2.1 INTRODUCTION

According to Ridley (2012) literature review is a systematic method of identifying, evaluating and synthesizing existing body of literature completed and recorded work by different scholars. In this chapter the researcher reviewed other studies carried out by different researchers concerning the knowledge and practices regarding malaria. This chapter will focus on the two specific objectives which are to assess the level of knowledge and to describe the prevention practices of community members at Mutale Municipality regarding malaria.

2.2 Knowledge about malaria

Knowledge of malaria refers to signs and symptoms, causes, transmission, source of malaria information, knowledge about traditional medication related to malaria, modern medications related to malaria and treatment seeking behaviour.

2.2.1 Knowledge about the signs and symptoms of malaria

Sumari, Dillip, Ndume, Mugasa, and Gwakisa,(2016) revealed that in Tanzania Most children had knowledge about the signs and symptoms of malaria. Fever, headache, body weakness, and loss of appetite were the most mentioned signs and symptoms of Malaria. Bravo (2017) revealed that in Kenya majority of the participants had high level of knowledge regarding malaria before malaria education was provided to them. Nsanga, Njunda, Kamga, Assob, Wiysonge, Nsangha, and Njamnshishy, (2011) revealed that in Cameroon majority of the participants knew fever and chills as malaria symptoms. Headache, joints pains and vomiting were less mentioned as signs and symptoms. Brooks and Abney (2013) conducted a study on perceptions of malaria in Limpopo province. According to the study results most participants were able to identify correct symptoms (headache, vomiting and fatigue) of malaria. Few had no knowledge regarding malaria symptoms.

Aderaw and Gedefaw (2013) revealed that in Ethiopia 63.85% of people who live in rural area showed little knowledge about signs and symptoms of malaria as compared to people who live in urban areas of Ethiopia. Ferero, Chaparro, Vallejo, Benavides, Gutierrez, Arevalo-Herrera, (2014) revealed that in Columbia most participants mentioned fever, headache and chills as the major signs detected in a person with malaria. Myalgia, arthralgia, weakness and sweating were also mentioned as major signs of malaria.

In Kenya most participants mentioned fever as main sign and symptom of malaria, followed by chills, vomiting and loss of appetite. Only few respondents mentioned joint pain and headache (Ondari 2012). Soleimani-Ahmadi, Vatandoost, Zare, Alizadeh, and Salehi,(2014) revealed that the most signs and symptoms of malaria are fever and chills. Ngarivhume, Vant Klooster, De Jong, and Van der Westhuizen, (2015) conducted a study in Zimbabwe and revealed that most participants reported malaria symptoms as feeling cold, goose pimple and headaches.

2.2.2 Knowledge regarding malaria transmission

Brooks and Abney (2013) revealed that majority of participants mentioned mosquitoes as the cause of malaria. Only few participants indicated that malaria is caused by dirty water or sugar cane. Sumari et al., (2016) revealed that in Tanzania only few children had misunderstanding regarding malaria transmission. They associated malaria with eating dirty foods, going to the toilet without shoes, contact with a person suffering from malaria (Sumari et al., 2016). Aderaw et al., (2013) indicated that in Ethiopia participants indicated that malaria is transmitted through mosquito bite. In the same study participants also mentioned bad odour, eating contaminated food and being in contact with the infected person can transmit malaria. Majority of the participants indicated that malaria transmission usually occurs at night (Aderaw et al., 2013).

2.2.3 Knowledge about causes of malaria

According to Chirebvu, Chimbari, and Ngwenya, (2013) most particicpants associated malaria as a disease caused by rainfall, floods and harvesting. In 2013 Chirebvu *et al.,* (2013) also indicated that in Botswana majority of the participants indicated that malaria is caused by mosquito bite and only few participants did not know what causes malaria. According to Soleimani-Ahmadi et al., (2014) in Iran mosquito bite was the most mentioned cause of Malaria. In Zimbabwe Ngarivhume (2014) revealed that majority of the participants indicated that malaria is caused by mosquito bite. According to Ondari (2012) most participants showed sufficient knowledge regarding the type of mosquito that causes malaria and they also mentioned that female mosquitoes and stagnant water causes malaria.

Forero et al., (2014) indicated that in Columbia most participants revealed that malaria is transmitted through infected mosquito. Few participants indicated blood transfusion as a way of transmitting malaria. Singh, Musa, Singh, & Ebere, (2014) conducted a study on Knowledge, Attitude and Practices on Malaria among the Rural Communities in Aliero, Northern Nigeria. The

study revealed that few participants mentioned plasmodium organism as the main cause of malaria. Majority of them reported mosquito bite as cause of malaria. Singh et al., (2014) revealed that stagnant water leads to mosquito breeding. Majority of the participants had Knowledge about mosquito biting time and they indicated that it bites at night. They indicated that mosquito rests in dark places inside the house during the day.

Sumari et al., (2016) indicated that in Tanzania Participants had knowledge about malaria transmission and they mentioned that not all mosquitos causes malaria but only a female mosquito called anopheles, few participants did not know the type of mosquito that cause malaria.

Nsanga *et al.*, (2011) revealed that in Cameroon few participants knew about the correct causes of malaria which is mosquito bite. Majority of the participants mentioned incorrect causes of malaria. They mentioned causes such as bad weather, bad food, a curse from an elderly person, using unclean water result in malaria. However few participants mentioned that poor knowledge of environmental sanitation to prevent malaria is the cause of malaria. Few participants believed that drinking alcohols such as beer, whisky, and wine lead to malaria. Musoke, Karani, Sempebwa, Musoke, Etajaka, and Guwatudde, (2015) revealed that majority of participants indicated that mosquito bite causes malaria. Few participants indicated that bad weather, drinking un-boiled water and eating maize causes malaria. According to Mugao, Mohamed, Garama, and Anjili, (2014) in Kenya majority of participants believed that poverty causes malaria. Participants also mentioned that lack of knowledge regarding waste disposal also causes malaria.

2.2.4 Knowledge regarding traditional medicines

Ngarivhume (2014) argued that in Zimbabwe most participants indicated that they knew about traditional medicines used for treating malaria. They mentioned medicines such as leaves, roots, bitter fruits and salty water. Most participants believed that malaria can be cured using traditional remedies but they also visit the hospital after consulting the traditional healers. Ondari (2012) revealed that few participants had knowledge regarding tradition medicines that can be used to prevent and treat malaria. They mentioned that eating goat offal can prevent malaria. Other participants mentioned that they use herbs, cow dung, pyrethrum flowers and cypress leaves to prevent and cure malaria.

2.2.5 Knowledge about the sources of malaria information

In Limpopo province few participants indicated that they heard about malaria by representatives from the Department of Health doing home visits. Most participants indicated that they learned about malaria from local clinics. Few indicated that they heard malaria at school and one participants learned from personal experience (Brooks and Abney 2013).

Chirebvu (2013) indicated that in Botswana most participants stated that they learned about malaria from clinic posters, community meetings and few participants did not know about malaria. Musoke *et al.* (2015) indicated that in Uganda most participants had heard about malaria or seen messages about malaria. Majority of the participants mentioned that they had received malaria information from the radio, few learned about malaria from health facilities and community leaders. Shimaponda-mataa, Tembo-Mwase, Gebreslasie, and Mukaratirwa,(2017) revealed that in Zambia majority of participants have heard about malaria and healthcare facilities were the major source of information, followed by radio and community health workers.

According to Soleimani-Ahmadi *et al*. (2014) in Iran the major source of malaria information is the community health workers and media. Religious leaders, newspapers and books were also a good source of information.

2.2.6 Treatment seeking behaviour and prevention

According to Kazura (2012) understanding the importance of treatment seeking enables the community, government and international agencies to improve the efficacy of malaria interventions by implementing programs suitable for specific regions. Shimampoda-Mataa *et al*., (2017) revealed that majority of the participants visit the health facility within 24hrs after recognizing symptoms.

Sumari *et al.* (2016) revealed that majority of children in Tanzania mentioned that when experiencing symptoms they would ask their parents to accompany them to the health facility for treatment. Only few respondents indicated that they would ask their parents to buy medication for them (Sumari et al. 2016). According to Brooks and Abney (2013) majority of the participants indicated that on onset of initial symptoms they would go to the clinic for consultation and treatment. Few participants mentioned that they would wait for a day after symptoms has occurred and then visit the clinic to seek treatment. All participants also mentioned that they would not wait for more than 3 days without visiting the clinic for consultation and treatment.

Chirebvu (2013) indicated that in Botswana all study participants would prefer to seek treatment at the clinic whenever they had symptoms. Chirebvu (2013) recommended that in Botswana health education should focus on malaria prevention and national elimination program in order to sustain and increase their success in 2016. According to Gupta, Raina, Shora, Jan, Sharma and Hussain, (2016) in India most participants would visit doctors at government hospitals for malaria treatment and would do so in less than 24 hrs. Ondari (2012) revealed that in Kenya majority of study participants mentioned that they would visit the hospital for treatment after failure of self-medication. Few participants mentioned that they would seek hospital treatment immediately after recognizing symptoms.

According to Musoke *et al.*, (2015) in Uganda most participants seek medical attention at the government health facilities and only few visited the private facilities. Musoke *et al.,* (2015) also revealed that few participants visited the clinic on the same day that the symptoms developed, while most participants mentioned that they visited the clinic within 1-3days. Musoke *et al.,* (2015) reported that some did not seek medical attention due to several reasons. Only few mentioned that they had no money to take the child to the nearest health facility. The travelling distance mentioned by most participants was 1-4 kilometers to reach the nearest health facility. Only few had travelled for more than 5 kilometers. Musoke *et al.,* (2015) recommended that different prevention practices should be used not only the indoor residual spraying but also the installation of proofed windows and ventilation.

2.3 Prevention practices related to malaria

Chirebvu (2013) indicated that majority of the participants in Botswana knew about the preventive measures of malaria. Only few did not know about the preventive measures. According to Nsanga (2011) most participants were using the correct preventive methods of malaria and most were not using the correct method for preventing malaria. Among those who were using the correct preventive methods few were using traditional medicines that repel mosquitoes, others mentioned environmental sanitation such as clearing grasses, and destroying water pools around the houses, aerosol insecticides, and mosquito coils. Few participants used chemoprophylaxis and mosquito net to prevent malaria. Among those who were using incorrect methods, most of them did not know about the preventive measures of malaria.

Ondari (2012) revealed that in Kenya most people prefer clearing of bushes and drainage of stagnant water to prevent malaria. Other participants mentioned that they use mosquito nets and

repellents to prevent malaria, only few participants were found to be using ITNs. According to Brooks and Abney, (2013) majority of participants knew only one preventive method. Few were able to mention two preventive measures. Recommended measures are available on the WHO guidelines for malaria.

In Botswana Chirebvu (2013) revealed that few participants used indoor residual spraying, and clearing vegetation as a preventive method. Only few did not practice any preventive measures. In Uganda musoke et al., (2015) revealed that majority of the participants used mosquito nets to prevent malaria and few depend on spraying of houses with insecticides. In Uganda most of household had at least one mosquito net for preventing malaria and they mentioned issue of poverty and large family size. Only few participants used indoor residual spraying that had been done by members of the household. Musoke *et al*., (2015) found that in Uganda most of the houses were found with stagnated water and having vessels that could hold water for mosquito breeding. The study also revealed that mosquito a number of pools of water in the community existed that could be used by mosquitoes for breeding.

Tanzania had a reduction of about 75% of malaria cases due to the use of treated bed nets, leading to reduction in malaria mortality rate of children between 6months and 2years. In New Guinea according to Kazura (2012) findings revealed that due to the use of treated bed nets mosquitoes shifted to pigs and dogs and changed their resting place from indoors to outdoors. Kazura (2011) indicated that in Guinea the use of treated bed nets lead to a reduction in malaria mortality rate in children.

Ferero *et al.,* (2014) indicated that in Columbia majority of the participants control indoor malaria transmission with the use of insecticide treated nets (ITN) for malaria protection, and few participants used home spray. Regarding outdoor mosquito control, few participants mentioned that they regularly monitor the presence of standing water in their households and neighborhoods and destroy them to prevent breeding. Soleimani-ahmadi *et al., (*2014) indicated that most households uses mosquito nets to prevent malaria. Participants also mentioned the use of indoor residual spraying. Soleimani-ahmadi et al., (2014) recommended that in Iran educational intervention should aim on changing the attitude and practice of people regarding malaria and its control in the studied population. Standardized verbal and written education should include information on the regular use and instructions on washing and drying of bed nets, in order to improve malaria elimination program in Iran (Soleimani-ahmadi, *et al*., 2014).

Gupta *et al.,* (2016) conducted a study on household survey to assess community knowledge, attitude and practices on malaria in a rural population of northern India. The study revealed that most participants preferred using mosquito repellents instead of bed net usage. Regarding preventive practices, more than half of the participants mentioned that they would avoid collections of stagnant water while a quarter of them would prefer indoor spraying. Singh et al., (2014) reported that majority of the participants mentioned bed nets as the most common known protective method against malaria. Most participants had knowledge of (ITNs). Few participants reported the use of mosquito coils. Most participants had knowledge on ways to prevent mosquito breeding, they mentioned cleaning of house surroundings and draining of stagnant water.

Conclusion

Several studies on knowledge, attitude and practices have been conducted worldwide. Most of this studies were conducted in sub-Saharan Africa. In many countries participants demonstrated knowledge regarding malaria transmission, causes, signs and symptoms and prevention practices. Most studies revealed that participant's uses bed nets and others depend on indoor residual spraying. In most countries indoor residual spraying is done once during malaria season. Participants seems to have a better knowledge regarding malaria and its prevention method. There is a high need to strengthen the current strategies to reduce malaria in Sub-Saharan Africa.

CHAPTER THREE: RESEARCH METHOLODY

3.1 Introduction

This section discusses the following items: study design, study setting, study population and sampling, data collection instrument, validity and reliability, data collection method, plan for data analysis, ethical considerations, dissemination and implementation of the results.

3.2 Study design

A research design is the overall plan for obtaining answers to the research question (Nettina, 2012). Akinsola (2005) defines research design as a plan according to which data will be assembled. A quantitative, cross-sectional descriptive survey design was used to assess community members at Masisi village regarding their knowledge of malaria and preventive practices. Polit and Beck (2012) define quantitative study as a structured (or systematic collection of numerical information or data) investigation of events or interest that yields numerical information enabling statistical analysis. The aim of this study was to assess community knowledge and practices of malaria at Masisi village, in Mutale Municipality, Vhembe District. Based on the purpose of this study a quantitative study was considered the best design in which variables such as knowledge and practices will be well addressed. A cross-sectional descriptive study allows the researcher to examine data at a point in time, meaning the researcher collects data at a point in time rather than at several points in time (Akinsola 2005).

3.3 Study setting

The study was conducted at Masisi village which is under Mutale Municipality, Vhembe District, and northern region of Limpopo Province, South Africa. The village is under the leadership of chief Mundalamo. The distance to Masisi village is about 70km from Thohoyandou and 140km from Musina. The village is serviced by one clinic, and Department of Agriculture. Masisi village is being transformed to a location which currently has three phases. Community members seek medical assistant at Masisi clinic and referrals are sent to Donald Fraser hospital which is approximately 60km. The village is combined with the new location and has a total of 1720 houses. Masisi village and location is a very hot and dry area. The maximum temperature is likely to reach 40 degree Celsius during summer. Masisi is a flat area but has few villages that are surrounded by mountains. Most people live in RDP houses and the area consists of few shacks.

Waste is managed by the municipality once a week but most people are still using their own yards for wastes disposal.

3.4 Study population

Akinsola (2005) defines a population as a well-defined group of people or other entities that have certain specified properties. In this study the research population included community members of Masisi village from the age of 18 to 75 years. The village comprised of 260 household and approximately 3902 residence as shown in the table 1. The researcher cannot study the whole population therefore a sample was drawn from the population to determine participants of this study.

Table 1: Distribution of residents within Masisi village

Masisi Township	Total number of households	Number of residence
Block 1	42	440
Block 2	50	358
Block 3	60	504
Old Masisi(village)	108	2600
Total	260	3902

Source: Royal Council register, 2017.

3.5 Sampling Method

Sampling is the process of selecting cases to represent an entire population so that inferences about the population can be made (Nettina 2012). Sample is a part of fraction of a whole, or a subset of a larger set, selected by the researcher to participate in research study (Brink, 2011). In this study the sample was drawn using the probability sampling. Brink, (2011) defined the probability sampling as imperative in the manner that each group in the population has equal and independent chance of selection in the sample**.** In this study a systematic sampling method was used wherein the households were divided into clusters. Each cluster constituted a certain percentage of the population depending on the number of households in each block or phase.

3.6 Criteria of inclusion

Community members from the age of 18 and 75 years, who are permanent residents of Masisi Village agreed to participate in the study. The researcher did not come across a child headed family.

3.7. Sampling Size

In this study the Slovin's formula, Nettina (2012) was used to calculate the sample size, where N is the total number of houses at Masisi village in Mutale Municipality, n is the sample size, and e is the level of error, in this study e is 0.05:

$$n = \frac{N}{1+N(e)^2}$$

$$= 260/ [1+260 (0.05)^2]$$

$$= 260/ 1+ [260(0.0025)$$

$$= 260/1+0.75$$

$$= 260/1.75$$

$$= 151$$

The sample size was 152 to include room for non-reply

Table 2: Sampling Frame

Masisi Township	Total no of sample in each Blocks	Percentage
Block 1	151/260x42=24	9%
Block 2	151/260x50=29	4.6%
Block 3	151/260x60=34.8	5%
Old Masisi (village)	151/260x108=62.7	81.4%
Total	151	100%

3.8 Sampling procedure

Systematic sampling was used in this manner: The total number of households was divided by the sample size in order to find the K-value e.g. 260/151=1.7

K-value is the sampling interval width. Sampling interval is the standard distance between sampled elements (Nettina 2012).

This means that in all the blocks every 2ND household was chosen to form part of the study, however the 1st household was chosen randomly by the researcher and the other household was chosen following the 2ND interval. When a member of the chosen household refuses to participate the next household was included. In each household one member who is between the age of 18 and 65 years had completed the questionnaire preferably the head of the house.

3.9 Data collection tool

The researcher used a self-administered questionnaire where the participants were completing the questionnaire by themselves. Illiterate participants were assisted by the researcher. In order to meet the objectives of the study the researcher worked alone. She believe that there will be minimal biases as she is a qualified researcher and took her time during data collection. The questionnaire was designed using open and closed ended questions. The participants were given a brief description on the importance of the questionnaire and how to complete it. The researcher decided to use a questionnaire in order to gather responses in a standardized way and to make sure the specific objectives of the study will be covered by the responses. The researcher used a

questionnaire because it maintains the participants' privacy since it does not require the name of the participant. The researcher developed the question based on other previous studies. It was divided into three sections namely: section A: demographic information, Section B: knowledge regarding malaria and Section C: prevention practices related to malaria. The questionnaire was written in English and was given to a language expert to translate it into Tshivenda. It was then translated back into English by the language expert to ensure that the original meaning is maintained.

3.10 Validity and Reliability

3.10.1 Validity

Maree (2016) defines" validity of an instrument as the extent to which it measures what it is supposed to measure". Validity sometimes is used to mean "true" or "correct. The researcher believed that the information that was provided by the participants was valid as they were responding to the questionnaire provided by the researcher. In this study the researcher ensured validity by means of content and face validity.

3.10.1.1 Content validity

"Content validity refers to the extent in which the instrument covers the complete content of the particular construct that is set to be measured" (Maree, 2016). In this study the researcher presented the proposal to the school of Health Sciences, and the experts in the field provided the researcher with comments before finalizing the instrument.

3.10.1.2 Face validity

"Face validity refers to the extent to which an instrument looks valid. It means that the instrument appear to measure what it is supposed to measure "(Maree, 2016). Since this method cannot be tested, the instrument was given to the expert from school of health sciences to ensure high degree of validity. The researcher used feedback from the experts to modify the instrument.

3.11 Reliability

Reliability is the extent to which a measuring instrument is repeatable and consistent. It is when the instrument is administered or used in different times to different participants from the same population but gives the same results (Maree 2016). An internal consistency method of reliability was used were in only one sample of data was used to estimate the internal consistency reliability. Questionnaires were distributed to participants who do not form part of the study but who have the same characteristics with the main respondents. This was done in one day and comparism were made based on respondents' response. This type of reliability measures how participants respond to one set of questions. Cronbach's alpha was used to analyze the report. Cronbach was 0.85 which indicate a strong relationship as it is closer to 1.

3.12 Pre-Test

According to Babbie and Mouton (2001) pre- testing is the stage that involves the testing or piloting of elements such as sampling frame, survey questions and data collection tools. Pretest was done in Sanari village, which is near Masisi as they share the same characteristics. A total of 10 households was used during pre-test, to check if respondents understand the questions on the research tool. This helped the researcher to adjust the questionnaire and make corrections where necessary, based on the respondent's comments. These respondents were not part of the main study and their data was not included during analysis.

3.13. Data Collection Method

A self -administered questionnaire was used to collect data. The researcher visited Masisi village to consult with the traditional leader for permission to conduct the study. Community members were addressed during community meetings that was held at the village. Households were selected randomly from the list of each block that was obtained from the traditional leader and the community chairperson representing blocks 1 to 3. The researcher then visited the household for data collection. The questionnaire was administered by the researcher to the participants. During the completion of the questionnaire the researcher was in the same room in case the participants needed clarity with the questionnaire. To meet the objectives of the study the researcher administered questionnaires door to door to the participants who had agree to participate in the study. Participants who cannot read or write were assisted by the researcher by reading the

questions and write the answers as they were responding. Questionnaires were completed on site to reduce non-responses.

3.14. Data Analysis Method

The statistical analysis was carried out by using the Statistical Package for Social Sciences (SPSS version 24.0) to analyse the data because the findings of the study were recorded in numbers. Smith, (2014) define statistical analysis as the fun of finding pattern in data, the pleasure of making discoveries, and the ability to guide decisions. This requires raw data or numerical codes for computerised data analysis. When analysing data, each questionnaire was coded and all sections were thoroughly checked. Missing data was checked with the data collection form and questionnaire. Cross tabulation was used to analyse data between two variables for instance marital status and causes of malaria. The chi-square test of independence was also used to test if there is a relationship between two categorical variables. The p-value was used in order to make decisions whether there is an association between the categorical variables. After analysis results was presented in tables, graphs and reflected in percentage.

3.15 Ethical Considerations

Ethics is the responsibility that researchers should bear towards those who participate in researching those sponsors, research those who are potential beneficiaries of research (Monette 2008). The following ethics were taken into account when conducting the study, anonymity, confidentiality, informed consent and voluntary participation.

3.15.1 Permission to conduct the study

The research proposal was presented to the Department of public Health, and the Higher Degree Committee of the School of Health Science for quality assessment. The proposal was further submitted to the University of Venda Higher Degree Committee for the quality assurance and approval. The researcher then applied to the Research Ethics Committee at the University of Venda for ethical clearance to conduct the study. After the approval from Research Ethics Committee, the permission was requested in writing from the headman of Masisi village and committee members representing Blocks 1 to 3 (Appendix C).

3.15.2. Informed consent

A subject voluntarily agrees to participate in a research study in which he or she has full understanding of the study before the study begins (Brink 2011).

Participants were informed about the background of the study, what the study entails and what is expected from them (Appendix A: information sheet). Before completion of questionnaire, the respondents were required to sign consent forms. This was done in the language that the participants understand well (Tshivenda). Respondents were given an information sheet so that they have complete information regarding the study. The researcher explained the format of the questionnaire and inform participants that they should not write their names in the questionnaire to ensure privacy and anonymity.

3.15.3. Avoidance of Harm

According to De Vos (2011)" everything we do in life can possible harm someone and therefore researchers should weigh the risk against the importance and possible benefits of the specific research projects". Core ethical principles harm to participant's means we must anticipate before beginning research as the basic safety concerns (Meyer, 2009). In this study data were collected in a safe place (households) wherein participants and the researcher were not subjected to any harm. The questionnaire were written in such a way that it does not inflict any emotional or psychological harm to the participants. To avoid harm the researcher worked during the day and avoid working in the dark to prevent malaria transmission.

3.15.4. Voluntary participation

The participants were informed before data is collected about their rights when it comes to participation so that they can make a choice whether to participate in the study or not. To ensure voluntary participation informed consent forms were handed over to them to sign before participating in the study. They were informed that if they wish to withdraw from the participation they can do so at any stage or time without fear of being victimized. Although participants would not receive any remuneration, they will receive higher level of education on malaria and prevention practices method immediately after writing the research report. This will be done through posters regarding signs and symptoms, and prevention methods of malaria.

3.15.5 Confidentiality and Anonymity

Confidentiality means that the information obtained from the respondents through the research will not be made available to other people (Meyer 2009). Anonymity is provided when the

participant's specific responses and information will not be linked to the respondents in any way (Meyer 2009). The researcher had considered the ethic of confidentiality and anonymity by not asking the names of the respondents. In this study the information provided by participants were kept confidential and was only accessed by data analyst and supervisor. Questionnaires were stored in a secured place and the participant's information was not revealed to unauthorized person and will not be linked to them in any way.

3.16 Plan for dissemination and implementation of results

The study findings and recommendations will be kept at the University of Venda's library. Data will be disseminated at the local meetings in the presence of the headman of the village, committee members representing Blocks1 to 3 and all community members. Community members will be given health education posters regarding malaria and preventive methods. A copy of the findings will be given to the Department of Health at Vhembe District Municipality.

CHAPTER FOUR: FINDINGS OF THE STUDY

4. 1 Introduction

The previous chapter explained the methodology followed when conducting the study. The collected data were analyzed and the results or findings were presented in this chapter. The results were presented as they appear in a questionnaire. They were presented in tables, figures and in percentages.

4.2. Section A: Demographic information

In this study participants were asked to indicate the age, gender, marital status, employment status, level of education, type of housing and the number of people in each household. The results are shown in figures and tables below.

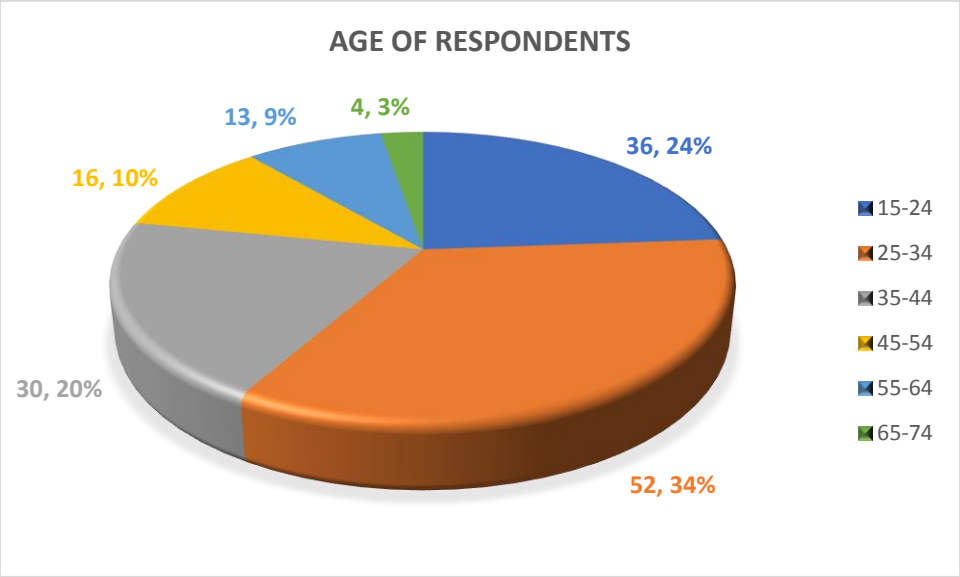

Figure 2: Age distribution of the participants. The findings shows that 34.4% of participants were between the ages of 25-34 and 2.6% were between the ages of 65-75.

Gender

The findings of the study shows that 59.9 %(91) of the study participants were females and 38.8 %(59) were males.

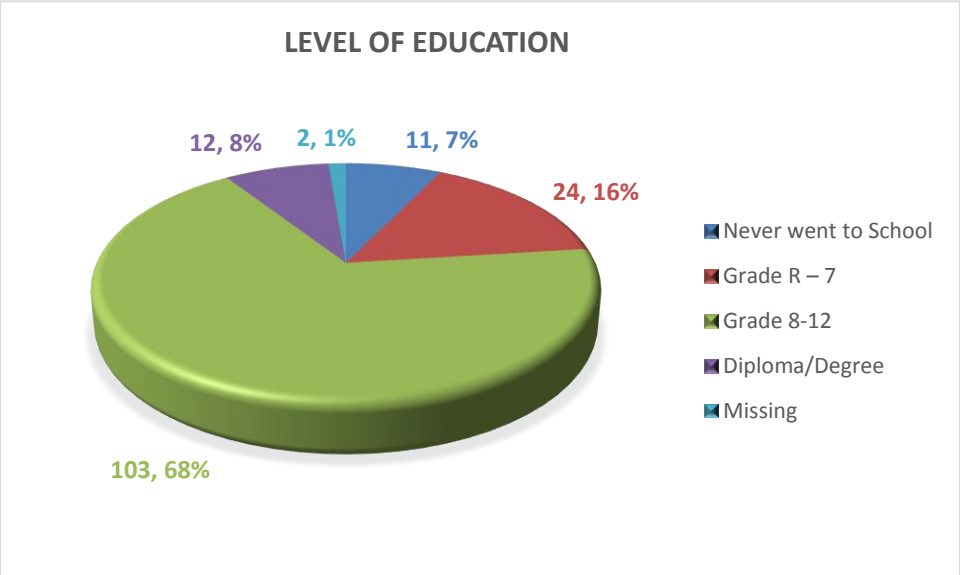

Figure 3: Level of education of participants. Findings revealed that 68% of participants were between grades 8 -12.

Table 3: Participants were asked about the type of housing and the findings are shown in the table below.

Type of housing	Number of participants	Percentage
Formal house	76	50.0
Shacks	6	3.9
RDP houses	67	44.1
Total	149	98.0

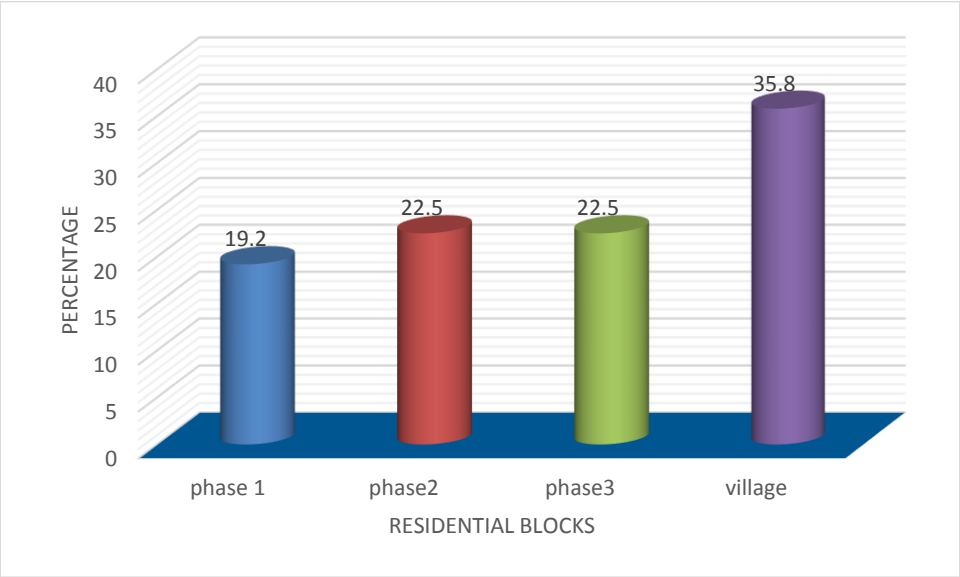

Figure 4: Residential blocks, about 35.8% indicated that they live at Masisi Village and others live in phase 1, 2. And 3.

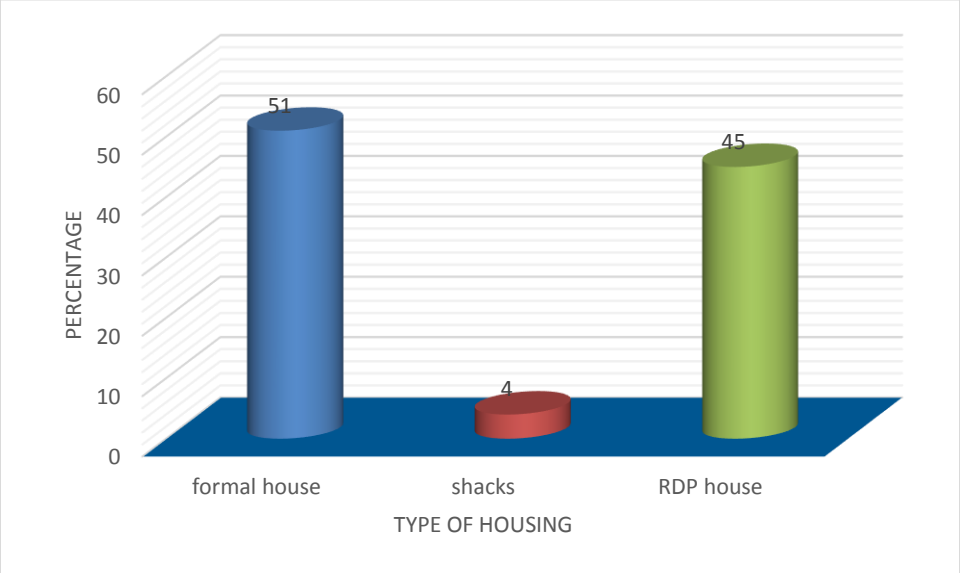

Figure 5: Type of housing. 51% of the study participants indicated that they stay in formal houses and only 4% stay in shacks.

Employment status

Findings of the study revealed that majority of participants 67.8 %(103) are unemployed and 27 %(41) are employed.

SECTION B: Knowledge regarding malaria

This section presents findings of knowledge regarding signs and symptoms of malaria, causes of malaria, how malaria is transmitted, sources of malaria information, where to seek medical attention, how long will they visit the health facility after suspecting malaria, participants were asked if they have ever suffered from malaria and if they have completed their treatment. Participants were asked about the distance they travel to reach the nearest health facility. The results are shown in graphs and tables below.

Table 4: Signs and symptoms of malaria.

Signs and Symptoms of Malaria	Number of participants	Percentage
Fever	27	17.76
Headache	46	30.26
Vomiting and Diarrhoea	36	23.68
Shivering	23	15.38
Other	20	13.16
Total	152	100.0

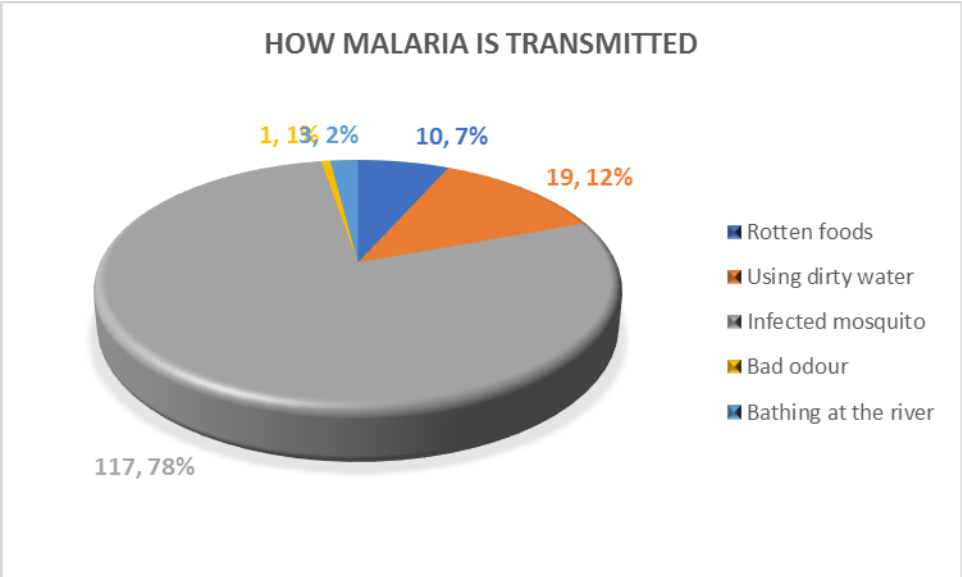

Figure 6: Majority of participants (78%) indicated that malaria is transmitted through an infected mosquito.

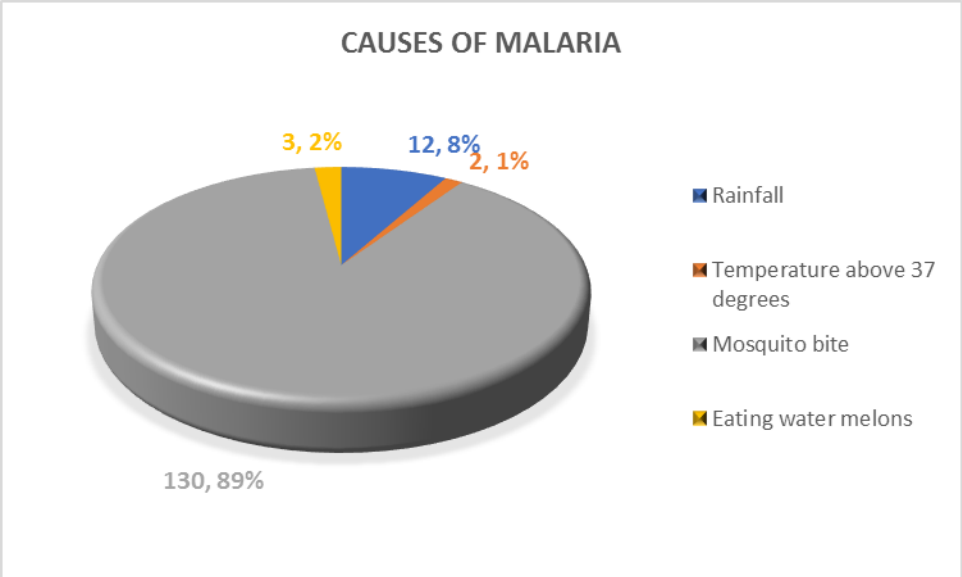

Figure 7: Mosquito bite was the most mentioned cause of malaria, this was indicated by 89% of the participants

Table 5: Sources of malaria information. Findings revealed that 43.4% heard about malaria from the nurses.

Sources of malaria information	Number	Percentage
TV&Radio	14	9.2
Community health workers	46	30.3
Nurses	66	43.4
Malaria investigative officers	16	10.5
School	6	3.9
Other	2	1.3
Total	150	98.7

Participants were asked if they have ever suffered from malaria before. 55,3% (84) indicated that they have suffered from malaria before and 1.5% have not suffered from malaria.

Table 6: when to visit the nearest health facility

When to seek medical attention after suspecting malaria?	Number	Percentage
Same day	51	33.6
2-3days	75	49.3
After 5days	9	5.9
Total	135	88.8

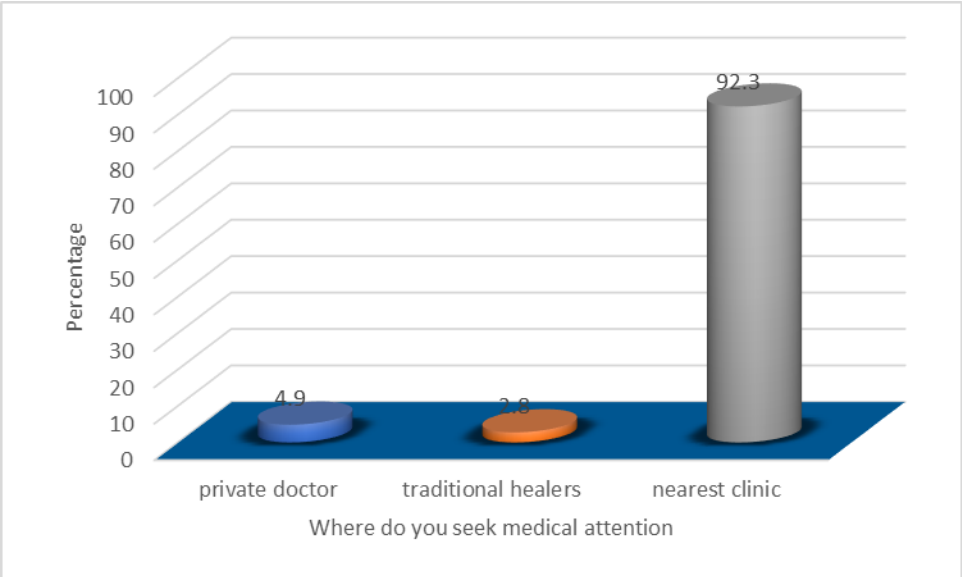

Figure 8: Where to seek medical attention after suspecting malaria. 92.3% indicated that they would visit the nearest clinic and 2.8% indicated that they would visit the traditional healers.

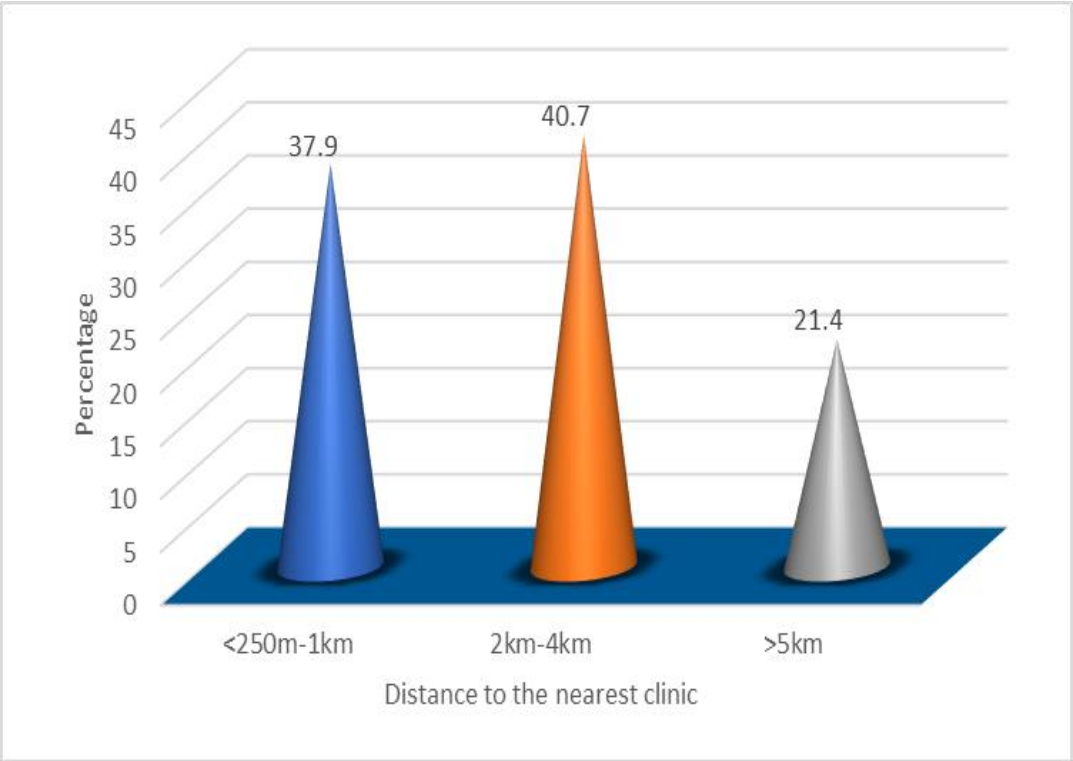

Figure 9: Distance to reach the nearest health facility.40.7 % travel for 2-4km and 21, 4% travel for more than 5km.

SECTION C: Malaria prevention practices.

This section presents the findings on the methods that the participants use in order to prevent or reduce mosquito infections at household level. Participants were asked if the government provide indoor residual spraying of houses and if they allow them to spray their houses. The results indicates that 38.51% are using mosquito nets and coils to prevent malaria. Findings also shows that 140 participants indicated that the government provide spraying of houses.

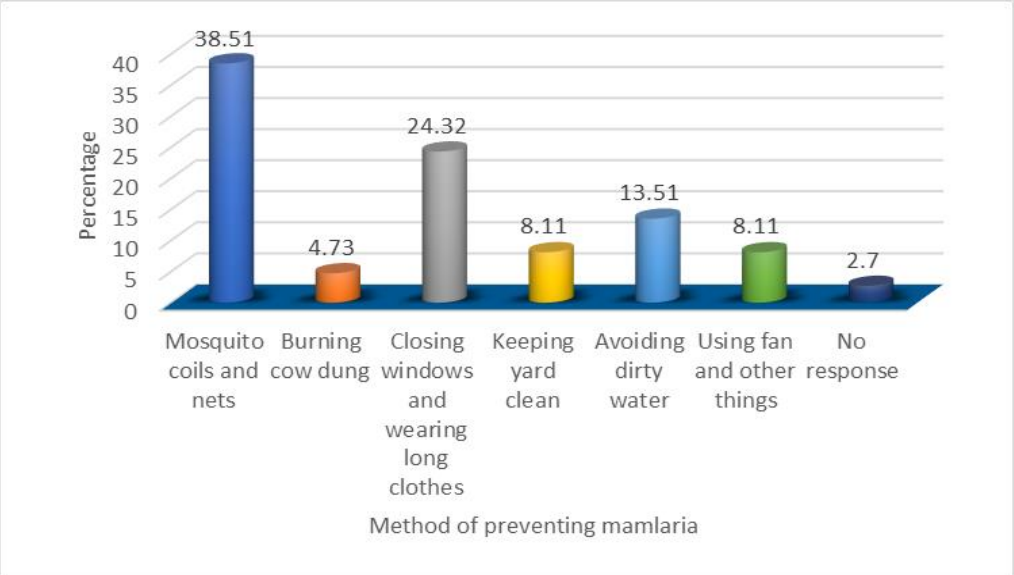

Figure 10: illustrates different methods that participants use to prevent malaria at household level.

Provision of indoor residual spraying.

Majority of participants 92, 1 %(140) indicated that indoor residual spraying was done. About 2, 1% indicated that their houses were not sprayed. 0, 7 % (1) indicated that they are not sure if spraying of houses was done. Participants were further asked if they allow the government to spray their houses. 94% indicated that they allow them to spray their houses in order to reduce malaria infections. 6% indicated that they did not allow them to spray their houses.

Table 7

The table below indicates the relationship between demographic information and knowledge regarding the causes of malaria. The results indicates that 29.3% of participants between the ages of 25-34years indicated that malaria is caused by mosquito bite. 50.3% of females indicated that malaria is caused mosquito bite. 2% of the unemployed participants indicated that malaria is caused by using dirty water. About 7.1% of the unemployed participants indicates that malaria is caused by eating rotten foods.

		Causes of malaria				Total
		Rainfall	Temperature	mosquito bite	eating water melon	
		percentage	percentage	percentage	Percentage	Percentage
Age	15-24	0.0%	0.0%	23.1%	1.4%	24.5%
	25-34	4.1%	0.7%	29.3%	0.7%	34.7%
	35-44	2.7%	0.0%	17.0%	0.0%	19.7%
	45-54	0.7%	0.0%	10.2%	0.0%	10.9%
	65-74	0.0%	0.0%	2.0%	0.0%	2.0%
	Total	8.2%	1.4%	88.4%	2.0%	100.0%
Gender	Male	1.4%	0.0%	37.4%	0.7%	39.5%
	Female	6.8%	1.4%	50.3%	1.4%	59.9%
Total		8.2%	1.4%	88.4%	2.0%	100.0%
Level of education	Never went to School	0.0%	0.0%	6.8%	0.0%	6.8%
	Grade R – 7	0.0%	1.4%	15.1%	0.0%	16.4%
	Grade 8-12	6.8%	0.0%	59.6%	2.1%	68.5%
	Diploma/Degree	1.4%	0.0%	6.8%	0.0%	8.2%
Total		8.2%	1.4%	88.4%	2.1%	100.0%
Employment status	employed	1.4%	0.0%	27.1%	0.7%	29.3%
	unemployed	7.1%	1.4%	60.7%	1.4%	70.7%
Total		8.6%	1.4%	87.9%	2.1%	100.0%

Table 8

The results indicates that about 27.3% and 25.9% of females and unemployed participants indicated that they heard about malaria information from nurses. About 4.0% and 9.3% of males and employed participants heard malaria from TV&Radio.

		Sources of malaria information						total
		TV&Radio	community health workers	nurses	malaria investigative officers	schools	other	
		percentage	Percentage	percentage	percentage	Percentage	percentage	Percentage
Gender	Male	4.0%	14.0%	16.7%	4.0%	0.7%	0.0%	39.3%
	Female	5.3%	16.0%	27.3%	6.7%	3.3%	1.3%	60.0%
	Total	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.7%
Total		9.3%	30.7%	44.0%	10.7%	4.0%	1.3%	100.0%
Employment status	employed	2.8%	6.3%	18.2%	0.7%	0.7%	0.0%	28.7%
	unemployed	6.3%	24.5%	25.9%	9.8%	3.5%	1.4%	71.3%
Total		9.1%	30.8%	44.1%	10.5%	4.2%	1.4%	100.0%

Table 9

The table shows the relationship between age, Level of education and knowledge regarding where to seek medical attention after recognizing malaria symptoms.

		Where to seek medical attention			Total
		private doctor	traditional healers	nearest clinic	
		% of Total	% of Total	% of Total	% of Total
Age	15-24	2.1%	0.7%	20.4%	23.2%
	25-34	2.1%	0.7%	31.7%	34.5%
	35-44	0.7%	1.4%	19.0%	21.1%
	45-54	0.0%	0.0%	9.9%	9.9%
	55-64	0.0%	0.0%	9.2%	9.2%
	65-74	0.0%	0.0%	2.1%	2.1%
Total		4.9%	2.8%	92.3%	100.0%
Level of education	Never went to School	0.0%	0.0%	6.4%	6.4%
	Grade R – 7	0.0%	0.7%	14.9%	15.6%
	Grade 8-12	4.3%	1.4%	63.8%	69.5%
	Diploma/Degree	0.7%	0.7%	7.1%	8.5%
Total		5.0%	2.8%	92.2%	100.0%

Table 10

Table below shows the participants response regarding provision of indoor residual spraying with regard to gender and employment status.

		Does the government provide indoor residual spraying of houses?			total
		Yes	no	not sure	
		percentage	percentage	percentage	percentage
gender	Male	36.8%	1.4%	0.7%	38.9%
	Female	59.7%	0.7%	0.0%	60.4%
	18	0.7%	0.0%	0.0%	0.7%
Total		97.2%	2.1%	0.7%	100.0%
employment status	employed	28.3%	0.0%	0.7%	29.0%
	unemployed	68.8%	2.2%	0.0%	71.0%
Total		97.1%	2.2%	0.7%	100.0%

Table 11

The table below shows participants responses on whether they allow the government to spray their houses or not.

		Do you allow them to spray your houses?		total
		Yes	no	
		Percentage	Percentage	Percentage
gender	Male	36.1%	2.1%	38.2%
	Female	56.9%	4.2%	61.1%
	18	0.7%	0.0%	0.7%
Total		93.8%	6.3%	100.0%
Employment status	employed	24.6%	4.3%	29.0%
	unemployed	68.8%	2.2%	71.0%
Total		93.5%	6.5%	100.0%

CHAPTER 5: DISCUSSION OF THE RESULTS

This chapter presents the discussion of the results as presented in the previous chapter.

5.1 DEMOGRAPHIC INFORMATION

The findings from the study area revealed that more than (34.2%; n=54) of the participants were between the ages of 25-34years and were females, presumably because most females are household heads and unemployed. Furthermore, most of them are single and unmarried. Similar findings were reported by Singh (2014) in Nigeria and Manana (2018) in Kwazulu Natal where females were more than males. However, the study was inconsistent with the findings of the study conducted by Shimaponda (2016) in Zambia who reported more males (76.3%) than females (23.7%).

The world health Organization (2007) has revealed that females who are pregnant are at risk of malaria than non-pregnant women due to decreased immunity. WHO (2007) further explained that men have greater occupational risk of malaria if working in mines, farms and forests during peak times or at night.

The level of education can affect the malaria treatment seeking and prevention behaviours. The study has revealed that majority of the participants had completed their grade 8 -12 (secondary education) and only 7% of the participants has never attended school. This means that the way the view and understand things cannot be the same as those who had secondary and tertiary education. WHO (2007) revealed that literacy level may affect one's ability to recognise signs and symptoms of malaria and knowledge of the available treatment. Masisi area has few secondary schools with one private school. Although most participants had secondary education only few had tertiary education. Masisi is a deep rural area which is far from urban and Central business areas. Similar study was conducted by Hlongwane (2011) on knowledge and practices towards malaria amongst the residents of Bushbuckridge, Mpumalanga, South Africa. The study revealed that about 58, 8% of the participants had secondary education.

The level of unemployment at Masisi is very high whereby only 27% of the participants were found to be working with 67, 8% of unemployment. Majority of the youth between the ages of 25-34 years were found to be unemployed. The level of education plays a vital role in the employment status of the family. As majority of the population at Masisi area are not educated it becomes difficult for them to find a permanent job. There are no farming projects going on at the village, there are no firms or construction companies around Masisi. Most people were working at Tshikondeni mine but they also needed qualifications. Around 2011-2012 the mine was closed down and most families were left being unemployed as many people were left without jobs. The qualified people who were working at the mine were taken to other branches and others were given their pension fund. Hence the level of unemployment is relatively high. The employed participants will be able to protect themselves from malaria as compared to the unemployed people. The cost of living is high and for them to live a healthy life it needs money. Money to buy extra protective measures in order to reduce the chances of being infected. Another challenge is that Masisi village is far from the Vhembe district offices and the Musina offices hence it is difficult for them to go and apply for learnership and internships. In a study conducted by Hlongwane in Swaziland majority of participants (473) were unemployed and 40 were trained employees (Hlongwane 2009).

The current study was conducted at Masisi village and the new residual blocks (phase1, 2, and 3). Majority of the participants live in formal houses and only 3.9% are staying in shacks. Most people in phase 1, 2 and 3 are staying in RDP houses. The type of housing plays an important role in malaria prevention. Those who live in formal houses who receive indoor residual spraying can be prevented for longer as compared to those staying in shacks. Good house construction may reduce malaria risks by limiting the entry of mosquito vectors (wanzirah 2015). Ondiba (2018) revealed that in Kenya houses with open eaves, grass thatched roof houses and mud wall houses has a higher vector density as compared to houses with closed eaves. IRS stays longer in plastered walls than in shacks without plastered walls. According to Hlongwane (2009) in Mpumalanga walls were replasted with no evidence of removal of IRS from the walls. The study further revealed that most participants are staying at Masisi village and the rest are staying at the new developed residential blocks (phase1, 2 and 3). Participants who live at Masisi village confirmed that they have been in that village for more than ten years. Phase 1, 2, and 3 has been existing for more than 5years and less than 10 years.

The new residential blocks has access to municipal waste removal that happens once a week, whereas there's no such at Masisi village. People from the village still keep their waste at their household, making it easy for mosquito to breed if not burned or well taken care of. Hence they might be more prone to malaria infection than those staying in well developed areas. According to Mmburu (2019) "improving housing and the built environment is a promising strategy to supplement long lasting insecticides-treated nets and indoor residual spraying for malaria control and elimination". Wanzirah (2015) indicated that mosquitoes enter the house through the gap between the top of the wall and the roof hence closing the open eaves reduces malaria infection.

5.2 KNOWLEDGE REGARDING MALARIA

Findings of the study revealed that majority of the participants had knowledge regarding the major signs and symptoms of malaria as they indicated headache, vomiting and diarrhoea and fever. Majority of people in this community understands about the symptoms because they have suffered from malaria before. Females were found to be more knowledgeable than men, this might be because most female's participants visited the clinic more often and health education regarding malaria is always given on each clinic visit. Furthermore, females were found to be unemployed and spend most of their time at home, this gives them more time to listen to radio and watch television where programmes about malaria can be presented. Knowledge regarding the signs and symptoms is essential in order to receive treatment early and prevent unnecessary further referral to the hospitals and or unnecessary death.

A similar study was conducted by Brooks and Abney (2013) on perceptions of malaria in Limpopo Province, and the study revealed similar results regarding signs and symptoms of malaria. Most participants indicated (headache, vomiting and fatigue) of malaria. However similar studies were conducted by Soleimani-Ahmadi, Vatandoost, Zare, Alizadeh, and Salehi,(2014) revealed that in Iran fever and chills,bone pain and abdominal pain are the major signs and symptoms of malaria. Another parallel results were reported by Ngarivhume et al. (2015) who revealed that in Zimbabwe most participants reported malaria symptoms as feeling cold, goose pimple and headaches.

About 78 %(n=117) of the participants correctly indicated that malaria is transmitted through infected mosquito. Only 7 %(n=10) indicated that malaria is transmitted by bathing at the river. Knowing the mode of transmission of malaria helps in preventing such infection. Participants between grades 8-12 had sufficient knowledge about malaria including those with tertiary education as compared to those who never went to school. Majority of participants had more

knowledge regarding the cause of malaria. Participants indicated that malaria is caused by mosquito bite and they went as far as identifying that the female mosquito (Gambia) is the causative organism of malaria. Only few participants indicated that malaria is caused by eating too much water melons, this is a sign of illiteracy and lack of knowledge. Although the elderly are aware about the causative organism of malaria, they still believe that malaria can be caused by eating too much water melons (bvani). To erase this misconception, Proper health education has to be provided to community members particularly the elderly through door to door visit by community health workers. Understanding the causes of malaria will help in prevention of malaria and reducing the number of new infections in the area. According to Sumari et al., (2016) most children who participated in the study in Tanzania had knowledge about malaria transmission and they mentioned that not all mosquitos causes malaria but only a female mosquito called anopheles, few participants did not know the type of mosquito that cause malaria. Furthermore Singh et al., (2014) indicated that most participants mentioned stagnant water as mosquito breeding area.

Majority of the participants had Knowledge about mosquito biting time. They mentioned that the infected mosquito bite at night. Majority of participants identified the indoor dark resting place during day as the resting places of mosquitoes. In this study participants did not mention that mosquito bite at night however they indicated that windows and doors should be closed to keep mosquitos from entering the house. They also indicated that they wear long clothes. Findings of the two studies are similar and most participants even showed further knowledge on how to prevent malaria. Forero et al., (2014) revealed that in Columbia most participants knew that malaria is caused by infected mosquito. Others indicated that malaria is transmitted through blood transfusion. The results are similar however participants in other studies did not mention about blood transfusion.

Findings of this study has revealed that nurses are the main source of information for malaria, followed by community health workers. Healthcare workers are helping the community understand malaria and how to prevent them. Community health workers who do door to door visit were found to be assisting more than our education system (schools). Health education should be emphasized more on television, radios and in schools in order to empower the community and reduce new cases of malaria. This should be done before and during malaria seasons. In Limpopo province few participants indicated that they heard about malaria by representatives from the Department of Health doing home visits.

Most participants indicated that they learned about malaria from local clinics (Brooks and Abney 2013). The findings are similar and it indicates that nurses and community health workers in Limpopo province are educating the community on malaria issues. According to Soleimani-Ahmadi *et al*. (2014) in Iran most participants identified community health workers as their main source of malaria information and media, for example television and radio. The findings further indicate that few participants received malaria information from religious leaders in community meetings. Newspapers and books were the least mentioned source of malaria information. Similar findings were reported by Hanofi-bojd et al. (2011) who reported that in Iran community health workers and nurses were the main source of malaria information.

The study revealed that majority of the participants had suffered from malaria before and they showed a better understanding of malaria than those who have never contracted malaria. This is based on personal experiences. Most of these people were treated at Masisi clinic and few were referred to Hospital for further management. Suffering from malaria has made the participants to gain more knowledge regarding the signs and symptoms of malaria and the importance of taking medication as prescribed. About 49.3% of the participants indicated that they visited the clinic after recognizing malaria symptoms while few indicated to have visited private doctors and traditional healers. It is an indication that participants knows what to do if affected by malaria. The study revealed that majority of the participants depend on the public health facilities because consultation is free. Additionally, elderly people still preferred traditional medicine over western medicine as they say that it works faster than the latter. The studies concurs with the findings done by Shimamponda-Mataa et al,(2017) and Musoke *et al.*, (2015) in Uganda and Zambia where participants attended health facilities within 24 hours upon noticing the signs and symptoms of malaria. Ondari (2012) indicated that participants in Kenya preferred to do self-medication before they visit the hospital.

Participant's knowledge regarding traditional medicines and modern medicines used in clinics and hospital is low. Only few people indicated that they know that malaria can be treated by traditional healers but they do not know the name of the treatment used. Although majority of the participants have suffered from malaria before, they lack knowledge regarding treatment used in clinics and hospitals. They do not know the treatment by name and only few knows the treatment by colour. Nurses have to provide education regarding the treatment used for treating malaria by name and colour. Ondari (2012) revealed that few participants had knowledge regarding tradition

medicines that can be used to prevent and treat malaria. They mentioned that eating goat offal can prevent malaria. Other participants mentioned that they use herbs, cow dung, pyrethrum flowers and cypress leaves to prevent and cure malaria. However parallel results were found in Zimbabwe, wherein most participants indicated that they knew about traditional medicines used for treating malaria. They mentioned medicines such as leaves, roots, bitter fruits and salty water. Most participants believed that malaria can be cured using traditional remedies but they also visit the hospital after consulting the traditional healers (Ngarivhume 2014).

Most participants have to travel for 2-4km to reach the nearest health facility. Only few participants indicated that they travel for more than 5km to reach the clinic. Participants staying in phase1, 2 and 3 are in a walking distance to reach Masisi clinic. The approved travelling distance is less than 5km. those travelling for more than 5kms should be assisted by mobile clinics around their areas. The findings of this study concurs with the study conducted by Musoke.et.al.,(2015) who indicated that majority of participants travel for less than 5km to reach the nearest health facility and only few had travelled for more than 5 kilometers.

5.3 PREVENTION PRACTICES OF MALARIA

For South Africa to move from control to elimination the community of Masisi village must form part of the reduction strategies to eliminate malaria in the area. South Africa achieves its reduction of malaria through indoor residual spraying of houses. However this is not enough.

Knowledge regarding the prevention practices is essential in order to eliminate malaria in the area. Participants have shown understanding regarding the prevention of malaria at household level. Only 2, 7% indicated that they do not practice anything at household level.

The rest of the participants indicated the use of mosquito net and coils to reduce malaria. Others mentioned keeping their yard clean, avoid keeping dirty water and burning of used tins and plastics to reduce mosquito breeding. Participants who are employed showed better understanding on how to reduce malaria and they indicated that they use coils, nets and fan to reduce mosquitoes in the house. Unemployed participants indicated that they buy coils only when they have money. They go as far as burning cow dungs to reduce mosquitoes in the house. They highly depend on IRS.

About 92% indicated that the government provide indoor residual spraying. Only few indicated that they did not receive indoor residual spraying. Those who did not receive IRS indicate that they were at work during the time when health workers were spraying the houses in their area. None of the participants indicate that they refused to receive IRS. It is essential for all household s to receive IRS in order to eliminate malaria in line with their own preventive measures. The challenge is that majority of participants indicated that IRS is only provided during malaria season. At Masisi village there is a high need to provide IRS twice a year, before and during malaria season. This will help in reducing new cases of malaria in the area. It will also help in moving Vhembe district from the control phase to the elimination phase. A findings were revealed by Emmanuela (2011) who reported that in Tanzania 64% of the participants were using mosquito nets to prevent from malaria, 8.6% uses antimalarial and environmental cleanliness.

Ferero *et al.,* (2014) indicated that in Columbia majority of participants control indoor malaria transmission with the use of insecticide treated nets (ITN) for malaria protection, and few respondents used home spray. Regarding outdoor mosquito control, few participants mentioned that they regularly monitor the presence of standing water in their households and neighborhoods and destroy them to prevent breeding. The results are similar but in this study there is no evidence of whether participants are using treated or untreated nets. Few participants also indicated that

they avoid keeping stagnant water because malaria breed in stagnant water. Another similar study was done in Nigeria by Singh et al., (2014) who reported that majority of the participants mentioned bed nets as the most common known protective method against malaria. Most participants had knowledge of (ITNs) and only few participants reported the use of mosquito coils. Most participants had knowledge on ways to prevent mosquito breeding, they mentioned cleaning of house surroundings and draining of stagnant water.

However in Botswana Chirebvu (2013) revealed that only few participants used indoor residual spraying, and clearing vegetation as a preventive method. Ondari (2012) revealed that in Kenya most people prefer clearing of bushes and drainage of stagnant water to prevent malaria. Other participants mentioned that they use mosquito nets and repellents to prevent malaria, only few participants were found to be using ITNs.

Summary

The study revealed that participants had knowledge regarding malaria and prevention practices which can be applied to reduce malaria. It is recommended that more information on malaria infection and prevention should be provided at schools and through television and radio. The community must be educated further on different prevention strategies. The level of employment is relatively high. Also there is a need for the government and companies to provide learnership and internship in order to empower the community and to create job opportunities. Nurses and community health workers are doing a great job in educating the community. Although the community knows the prevention practices of malaria it still need to be done practically in order to eliminate malaria in the area. Waste removal is still a challenge at Masisi village as compared to phase 1, 2, and 3. Most participants have sufficient knowledge regarding malaria.

Chapter 6

SUMMARY, LIMITATIONS, CONCLUSION AND RECOMMENDATIONS.

6.1 Introduction

This chapter summarizes the study and findings of the results. The chapter also discusses the limitations, conclusion and recommendations made based on the findings of the study.

6.2 SUMMARY

Malaria still poses a threat in the lives of people living in malaria endemic arrears. Participants showed adequate knowledge regarding malaria. Although the government is proving indoor residual spraying to prevent new cases from developing, the incidence rate is still high. Hence the provision of indoor residual spraying should be done twice in a year in order to eradicate malaria and to cover those that were not available during the first round of spraying. The rate of unemployment is high. The purpose of the study was to assess community knowledge and prevention practices of malaria at Mutale municipality in Vhembe District.

The objectives were to:

1. Assess the level of knowledge of malaria among community members at Mutale municipality.
2. Describe malaria prevention practices by community members at Mutale municipality. info

6.3 Limitation of the study

The researcher covered the participants between the ages of 18 to 75, therefore it will be important to conduct the study on secondary and primary school children. In addition it will also be important to conduct the study on pregnant woman since they are at high risk of malaria.

The researcher did not focus on nearby villages in Mutale municipality so it will be of high value to study other villages which are found in Mutale municipality

The study did not focus on the views or attitude of participants regarding malaria. There's a need to conduct a study on knowledge of malaria among travelers since a lot of people enter South Africa through the Limpopo River from Zimbabwe.

The study also did not go deeper in exploring if the participants are using mosquito coils and nets and other preventive methods they mentioned.

It is very much important that the views, attitude and practices of malaria be done in pupils at primary and secondary schools.

6.4 Conclusion

The findings of the study indicate that most community members are not employed and the level of education is very low. This is indicated by the data that shows that only few participants have diploma and degree. Although few people are staying in shacks, majority of those staying in formal houses and RDP house are many in each household. The results showed that majority of participants stay within 5km radius to the clinic. The village is nearer to the Phafuri gate of the Kruger national park and nearer to the Limpopo River that separates South Africa from Zimbabwe. This lead to a high rate of malaria transmission. The environmental condition of the area also influences the rate of malaria transmission. The findings of the study revealed that community members have knowledge regarding malaria transmission and its cause. They still have a misconception regarding causes of malaria. Most participants have a challenge in identifying the treatment used for malaria. The community shows understanding regarding the prevention practices at a household level however there is no evidence if these practices are being done. The community must be given education on knowledge of malaria and how to prevent it. The type of housing affect the government efforts in reducing malaria through indoor residual spraying of houses. Stakeholders should work with the community in order to eliminate malaria in the area.

6.5 Recommendations

The following recommendations were made based on the findings of the study:

6.5.1 Recommendations to the community members

Community members should be given education on the causes, signs and symptoms, how to control of malaria, this can be done through the provision of posters.

Prevention practices of malaria in a household level is still poor. Therefore they need to be taught about ways of preventing malaria apart from using nets and mosquito coils. They must be educated on keeping their yards clean, avoid keeping stagnant water because that is where mosquito breeds. They should also be educated on visiting the clinic within 2days of experiencing signs and symptoms of malaria.

6.5.2 Recommendations to Mutale Municipality

There's a need of waste removal at Masisi village in order to reduce breeding sites at house hold level. This can be done once or twice a week. The provision of refusal bags can also help in keeping dirty things in one place instead of throwing them around the household. Community development projects should be done in order to create jobs.

6.5.3 Recommendation to the department of health Vhembe district

The findings of this study revealed that most participants are using mosquito coils and mosquito nets to prevent malaria. However there is no decrease in the number of malaria cases reported. This may be due to the fact that they are using untreated nets instead of treated nets. The district should provide them with treated nets for free of charge in order to eliminate malaria in this area.

Indoor residual spraying of houses should be done twice a year in order to eliminate malaria.

Malaria awareness campaigns should be done quarterly in order to give the community more knowledge regarding malaria. Malaria should form part of health education provided at the clinic in order to eradicate it. Community members should be educated on the medicines that are used to treat malaria in clinics and hospitals

REFERENCE

Aderaw, Z. and Gedefaw, M., 2013. Knowledge, attitude, and practice of the community towards malaria prevention and control options in anti-malaria association intervention zones of Amahara national regional state, Ethiopia. *Global Journal of Medical Research*.

Akinsola, H.A. (2005). *Research methods in medical and nursing practice*.1st ed. Nigeria

Babbie,E., & mounton, J. (2001). *The practice of social research*. Cape Town: Oxford University press.

Bello-Bravo, J., Lutomia, A.N., Madela, L.M. and Pittendrigh, B.R. (2017). Malaria prevention and treatment using educational animations: A case study in Kakamega County, Kenya. *International Journal of Education and Development using Information and Communication Technology*, *13*(1), pp.70-86.

Brink, H., Van der Walt, C. and Van Rensburg, G. (2006). *Fundamentals of research methodology for health care professionals*. Juta and Company Ltd.

Brooks.,D. and Abney, K. (2013). Perceptions of Malaria in Limpopo Province, South Africa. *Journal of Young Investigators*, 25(1), pp.5-9.

Collins, H. (2000). Collins English Dictionary. Dictionary. Com.

Cullen, K.A. and Arguin, P.M., 2011. Division of parasitic diseases and malaria. *Center for Global Health, Centers for Disease Control and Prevention (CDC). Malaria surveillance–United States*, pp.1-17.

Chukwurah, J.N., Idowu, E.T., Adeneye, A.K., Aina, O.O., Agomo, P.U. and Otubanjo, A.O., 2016. Knowledge, attitude and practice on malaria prevention and sulfadoxine-pyrimethamine utilisation among pregnant women in Badagry, Lagos State, Nigeria. *Studies*, *8*, p.9.

Chirebvu, E., Chimbari, M.J. and Ngwenya, B.N., 2013. Knowledge and practices on malaria in Tubu village, in a malaria-endemic area in northern Botswana: implications for interventions. *Malaria World Journal*, *4*(15), pp.1-9.

Centre for disease Control and Prevention. (2014). Malaria facts. Atlanta.

Department of health. (2012). Malaria elimination strategic plan: 2012-2018. South Africa.

Dictionary, O. (2014). Oxford dictionaries: Language matters. Oxford University press.

De Vos, A.S., Schulze, S. & Patel, L. 2005. The sciences and the professions. In De Vos A.S., Strydom, H., Fouché C.B. & Delport C.S.L. Research at the grass roots for the social sciences and human service professions. 3 rd ed. Pretoria: JL Van Schaik Publishers.

Emmanuela.E.A.,Humphrey,D.M, Jorg.H.,Gabone,O. and Damasi,L.M.(2011). Reported knowledge, attitudes, and practices regarding malaria and mosquito net use among women seeking antenatal care in South -Western Tanzania. *Tanzania Journal of Health Research.*

Evlampidou, I., Danis, K., Lenglet, A., Tseroni, M., Theocharopoulos, Y. and Panagiotopoulos, T., 2015. Malaria knowledge, attitudes and practices among migrants from malaria-endemic countries in Evrotas, Laconia, Greece, 2013. *Euro Surveill*, *20*(33), p.21208.

Ezeigbo, O.R., Osuagwu, M.C., Ibegbulem, Z.O. and Agomoh, N.G., 2015. Evaluation of the Knowledge, Attitude and Practice of the Use of Insecticide-Treated Nets (ITNs) in Aba, Nigeria. *British Journal of Medicine and Medical Research*, *5*(1), p.57.

Forero, D.A., Chaparro, P.E., Vallejo, A.F., Benavides, Y., Gutiérrez, J.B., Arévalo-Herrera, M. and Herrera, S., 2014. Knowledge, attitudes and practices of malaria in Colombia. *Malaria journal*, *13*(1), p.165.

Fuge, T.G., Ayanto, S.Y. and Gurmamo, F.L., 2015. Assessment of knowledge, attitude and practice about malaria and ITNs utilization among pregnant women in Shashogo District, Southern Ethiopia. *Malaria Journal*, *14*(1), p.235.

Gupta, P., Anvikar, A.R., Valecha, N. and Gupta, Y.K., 2014. Pharmacovigilance practices for better healthcare delivery: knowledge and attitude study in the national malaria control programme of India. *Malaria research and treatment*, *2014*.

Hanafi-Bojd, A.A., Vatandoost, H., Oshaghi, M.A., Eshraghian, M.R., Haghdoost, A.A., Abedi, F., Zamani, G., Sedaghat, M.M., Rashidian, A., Madani, A.H. and Raeisi, A., 2011. Knowledge, attitudes and practices regarding malaria control in an endemic area of southern Iran. *Southeast Asian Journal of Tropical Medicine and Public Health*, *42*(3), pp.491-501.

Hlongwana, K.W., Mabaso, M.L., Kunene, S., Govender, D. and Maharaj, R., 2009. Community knowledge, attitudes and practices (KAP) on malaria in Swaziland: a country earmarked for malaria elimination. *Malaria Journal*, *8*(1), p.29.

Hlongwana, K.W., Zitha, A., Mabuza, A.M. and Maharaj, R., 2011. Knowledge and practices towards malaria amongst residents of Bushbuckridge, Mpumalanga, South Africa. *African Journal of Primary Health Care & Family Medicine*, *3*(1).

Hlongwana, K.W., Mavundza, E.J., Mohapi, E.P., Kruger, P., Urbach, J., Mukaratirwa, S. and Maharaj, R., 2013. Vector-control personnel's knowledge, perceptions and practices towards insecticides used for indoor residual spraying in Limpopo Province, South Africa. *Parasites & vectors*, *6*(1), p.118.

Kazura, J.W., Siba, P.M., Betuela, I. and Mueller, I., 2012. Research challenges and gaps in malaria knowledge in Papua New Guinea. *Acta tropica*, *121*(3), pp.274-280.

Khairy, S., Al-Surimi, K., Ali, A., Shubily, H.M., Al Walaan, N., Househ, M. and El-Metwally, A., 2017. Knowledge, attitude and practice about malaria in south-western Saudi Arabia: a household-based cross-sectional survey. Journal of infection and public health, 10(5), pp.499-506.

Maharaj, R., Mthembu, D.J. and Sharp, B.L. (2005). Impact of DDT re-introduction on malaria transmission in KwaZulu-Natal. South African Medical Journal, 95(11), pp.871-874.

Manana, P.N., Kuonza, L., Musekiwa, A., Mpangane, H.D. and Koekemoer, L.L., 2018. Knowledge, attitudes and practices on malaria transmission in Mamfene, KwaZulu-Natal Province, South Africa 2015. *BMC public health*, *18*(1), p.41.

Maree,K.(2016). First steps in research.2nd ed. Van Schaik. South Africa.

Masisi clinic,(2015). Malaria tick register Department of Health. Limpopo province.

Meyer, S., Naude, M. and Shangase, N. (2009). The Nursing unit manager. A comprehensive guide. Heinemann Publishers.

Monnette, D., Sullivan,T.,Timur,A., and Locklear.k.(2008).Research methods. Cengage Learning. USA.

Mogorosi, L.D. (2010). *Steps in the Research and Thesis Writing Process: Choices and Management.* Thohoyandou: University of Venda. Unpublished Guide.

Mburu, M.M., Mzilahowa, T., Amoah, B., Chifundo, D., Phiri, K.S., van den Berg, H., Takken, W. and McCann, R.S., 2019. Biting patterns of malaria vectors of the lower Shire valley, southern Malawi. *Acta tropica*, p.105059.

Mugao, K.N., Mohamed, D., Nimrod, N. and Christopher, A.O. (2014). Knowledge, Attitude and Practice of the Community towards Malaria Prevention and Control Options: A case study of Meru South District, Tharaka Nithi County, Kenya.

Musoke, D., Karani, G., Ssempebwa, J.C., Etajak, S., Guwatudde, D. and Musoke, M.B., 2015. Knowledge and practices on malaria prevention in two rural communities in Wakiso District, Uganda. *African health sciences*, *15*(2), pp.401-412.

Mgabisa, A.R., 2013. Analysis of Geographical and Temporal Patterns of Malaria Transmission in Limpopo Province, South Africa Using Bayesian Geo-statistical Modelling (Doctoral dissertation, University of KwaZulu-Natal, Durban).

Nettina,S.M.(2012).*Lippincott manual of nursing practice*. Wolters Kluwer Health. Philadephia.

Ndwiga, T., Kei, R.M. and Dancan, O.W., 2014. Utilization of Insecticide Treated Bed Nets among Mothers Attending MCH/FP in Webuye District Hospital, Bungoma County, Kenya. *Open Journal of Preventive Medicine*, *4*(06), p.470.

Ngarivhume, T., van't Klooster, C.I., de Jong, J.T. and Van der Westhuizen, J.H., 2015. Medicinal plants used by traditional healers for the treatment of malaria in the Chipinge district in Zimbabwe. *Journal of Ethnopharmacology*, *159*, pp.224-237.

Nsagha, D.S., Njunda, A.L., Kamga, H.L.F., Assob, J.C.N., Wiysonge, C.S., Nsagha, S.M. and Njamnshishy, A.K., 2011. Knowledge and practices relating to malaria in Ndu community of Cameroon: Signs and symptoms, causes and prevention. *Journal of Public Health and Epidemiology*, *3*(6), pp.294-300.

Ondari, P.N. (2012). *Assesment of Knowledge on Factors Contributing to Highland Malaria Outbreaks in Gucha District and Available Preventive and Control Measures. Kenya.* (Doctoral Dissertation).

Ondiba, I.M., Oyieke, F.A., Ong'amo, G.O., Olumula, M.M., Nyamongo, I.K. and Estambale, B.B., 2018. Malaria vector abundance is associated with house structures in Baringo County, Kenya. *PloS one*, *13*(6), p.e0198970.

Polit, D.F. and Beck, C.T. (2012). *Essentials of nursing research: Appraising evidence for nursing practice*. Lippincott Williams & Wilkins.

Radali,Z.M.,(2013). *The continuous recurrence of malaria transmission at Tshivaloni*. University of Limpopo. (Masters Dissertation)

Raman, J., Morris, N., Frean, J., Brooke, B., Blumberg, L., Kruger, P., Mabusa, A., Raswiswi, E., Shandukani, B., Misani, E. and Groepe, M.A., 2016. Reviewing South Africa's malaria elimination strategy (2012–2018): progress, challenges and priorities. *Malaria journal*, *15*(1), p.438.

Ridley, Diana. (2012) .*The Literature Review: A Step-by-Step Guide for Students*. 2nd ed. Los Angeles, CA: SAGE.

Singh, R., Musa, J., Singh, S. and Ebere, U.V., 2014. Knowledge, attitude and practices on malaria among the rural communities in Aliero, Northern Nigeria. *Journal of family medicine and primary care*, *3*(1), p.39.

Soleimani-Ahmadi, M., Vatandoost, H., Zare, M., Alizadeh, A. and Salehi, M., 2014. Community knowledge and practices regarding malaria and long-lasting insecticidal nets during malaria elimination programme in an endemic area in Iran. *Malaria journal*, *13*(1), p.511.

South African department of health. (2007). Prevalence and distribution of Malaria in South Africa. South Africa.

Sumari, D., Dillip, A., Ndume, V., Mugasa, J.P. and Gwakisa, P.S., 2016. Knowledge, Attitudes and Practices on Malaria in Relation to its Transmission: Among Primary School Children in Bagamoyo District, Tanzania. *MalariaWorld Journal*, *7*(2).

Shimaponda-Mataa, N.M., Tembo-Mwase, E., Gebreslasie, M. and Mukaratirwa, S., 2017. Knowledge, attitudes and practices in the control and prevention of malaria in four endemic provinces of Zambia. *Southern African Journal of Infectious Diseases*, *32*(1), pp.29-39.

Smith, M. J. (2014) *Statistical analysis handbook: A comprehensive handbook of statistical concepts, techniques and software tools.* United Kingdom: The Winchelsea press.

Wanzirah, H., Tusting, L.S., Arinaitwe, E., Katureebe, A., Maxwell, K., Rek, J., Bottomley, C., Staedke, S.G., Kamya, M., Dorsey, G. and Lindsay, S.W., 2015. Mind the gap: house structure and the risk of malaria in Uganda. *PLoS One*, *10*(1), p.e0117396.

World Health Organization. (2007). Gender, Health and Malaria. Geneva

World Health Organization. (2008). Knowledge attitude and practice survey. Geneva

World Health Organization. (2011). Results of WHO product testing of malaria: Round 1. Geneva.

World Health Organization, 2015. Malaria rapid diagnostic test performance: results of WHO product testing of malaria RDTs: round 6 (2014-2015).

World Health Organization. World malaria report 2016. Geneva: World Health Organization Google Scholar. 2016.

World Health Organization. World malaria report 2018. World Health organization Geneva.

APPENDICES

Appendix A: Information sheet

I am Munyai Livhuwani a master's student at the University of Venda registered for the degree of master of public health (MPH). I am supervised by DR. N.S Mashau and MRS. S. Tshivhase. The topic of my research study is assessment of community knowledge and prevention practices of malaria at Masisi at Mutale Municipality. You are kindly requested to participate in this study believing that your participation will make a great difference.

The research data will be collected by the researcher and the research assistant. Before data collection the researcher will handout consent form and explain the purpose of the study and also ethical principles to be adhered to. Data will be collected door to door. The researcher will distribute the questionnaire to all respondents who meet the inclusion criteria. The questionnaire will be filled in the presence of the researcher in order to provide clarity in case of any misunderstanding. This will also help those who cannot read or write and also to reduce the level of non-responses.

The collected data will be kept confidential and no unauthorized people will handle the data in any way. The information provided will not be linked to you in anyway and questionnaires will be discarded after analysis.

The researcher will further explain that respondents must not write their names in the questionnaire, the researcher will use codes rather than respondents names. Participation in this research study is voluntary and participants are allowed to withdraw from participating at any time should they feel uncomfortable in continuing in the research study.

The researcher will ensure that no physical, emotional or psychological harm is inflicted to the respondents during the course of the study. In case of any harm the researcher will make further referrals to necessary healthcare providers and a follow-up will be made based on the respondent's condition. However risk are minimal since data will be collected from household to household. The researcher will also ensure that the benefits are greater than the risk.

The respondent's response to participate in this study will allow the researcher to draw conclusion from the findings and make recommendations that can help the community of Masisi, nearby villages and Mutale Municipality. The researcher will also develop pamphlets to teach the community about malaria. E.g. symptoms and prevention methods of malaria.

Appendix B: CONSENT FORM

My name is **MUNYAI LIVHUWANI**, a master's student at the University of Venda, registered for the masters of public health (MPH). I am conducting a study under the topic "**assessment of community knowledge and prevention practices of malaria at Masisi village in Mutale Municipality".** The purpose of this study is to assess community knowledge and prevention practices of malaria at Masisi village in Mutale Municipality**.**

I hereby invite you to participate in this study that will be done through a questionnaire. The questionnaire will take about 30 to 45 min to complete. The information that you will provide will be kept confidential and will not be disclosed to anyone without your permission. Therefore it will not be linked to you in any way. The data will be used for academic purposes only and a high level of privacy and anonymity will be maintained. Questionnaires will be stored in a secured place and no unauthorized person (general public) will be allowed to have access to the questionnaires. Questionnaires will be discarded after analysis and report writing.

Participation in this study is voluntary and no remuneration (pay) will be made to you, therefore you are allowed to withdraw from the study at any stage should you feel uncomfortable. However respondents will receive first-hand information regarding malaria immediately after writing the research report. This will be through posters regarding signs and symptoms, and prevention method of malaria.

Researchers Signature…….. Date……..

I……..hereby read and understand the consent form and I declare that I am voluntarily participating in this research study.

Respondent Signature……Date……

If you're unable to sign please mark or put an **X** in the box provided. ☐

Witness signature:……Date……..

For more information regarding this research study, contact Munyai Livhuwani on:

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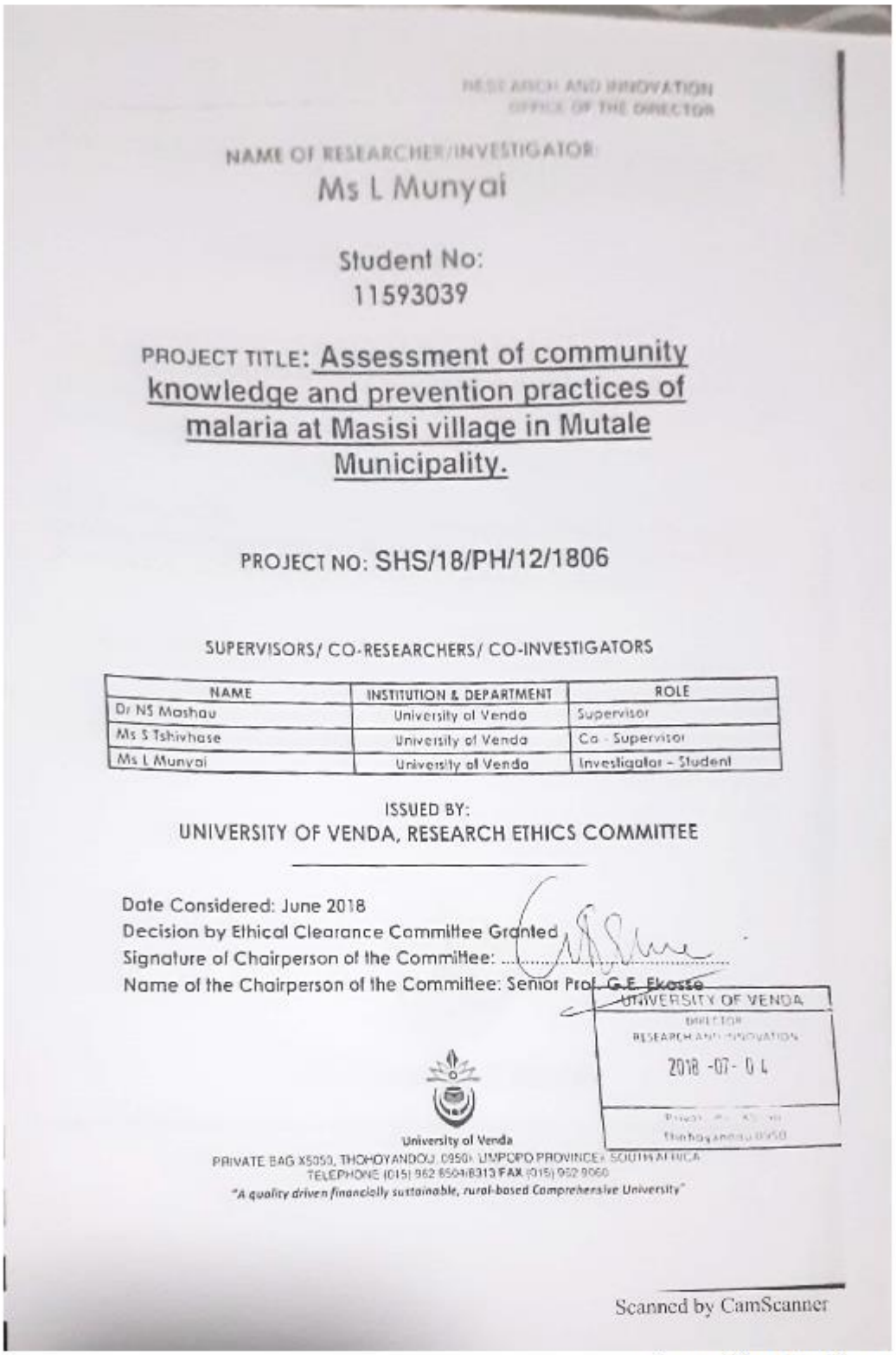

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
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Student No:
11593039

PROJECT TITLE: Assessment of community knowledge and prevention practices of malaria at Masisi village in Mutale Municipality.

PROJECT NO: SHS/18/PH/12/1806

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

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ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: June 2018
Decision by Ethical Clearance Committee Granted
Signature of Chairperson of the Committee: .....
Name of the Chairperson of the Committee: Senior Prof. G.E. Ekosse

UNIVERSITY OF VENDA
DIRECTOR
RESEARCH AND INNOVATION
2018 -07- 04

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Appendix D: QUESTIONAIIRE

Research questionnaire

Topic: Assessment of community knowledge and prevention practices regarding malaria at Masisi Village in Mutale Municipality. The aim of this study is to assess community knowledge and prevention practices regarding malaria at Masisi Village in Mutale Municipality.

Instructions

1 Do not write your name in any page of this questionnaire.
2. Do not tear any page in this questionnaire
3. Answer all questions and no discussions during the completion of this questionnaire
4. Please mark with an X in the space/box provided
5. Completion of this questionnaire will be 30 to 45 minutes.

Section A: Demographic information

1 .How old are you?

……

2. Gender

Male	1
Female	2

3. Marital status

Single	1
Married	2
Divorced	3
Widow	4

4. Highest grade passed

Never went to School	1
Grade R – 7	2
Grade 8-12	3
Diploma/Degree	4

5 Type of a household

Formal house	1
Shacks	2
RDP house	3

6 Number of people living in each household (including all children's)

1-4	1
5-9	2
>10	3

7 Which block (phase) do you come from?

Phase 1	1
Phase 2	2
Phase 3	3
The village	4

8 How long have you been staying here?

1-5years	1
6-9 years	2
>10years	3

9 Employment status

Employed	1
unemployed	2

SECTION B: Knowledge regarding malaria

10. List any major signs and symptoms of malaria (list as many as you can).

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11. How is malaria transmitted?

Rotten foods	1
Using dirty water	2
Infected moisquito	3
Bad odour	4
Poor hygiene	5
Bathing at the river	6

12. Knowledge about what cause of malaria? Choose only one answer

Rainfall	1
Temperature above 37 degrees	2
Mosquito bite	3
Blood transfusion	4
Eating water melons	5

13. What are the source of malaria information? Choose one answer

Tv&radio	1
Community health workers	2
Nurses	3
Malaria investigative officers	4
School	5
Other	6

14. Have you ever suffered from malaria?

Yes	1
No	2
Not sure	3

15. If yes did you complete your treatment?

Yes	1
No	2
Not sure	3

16 when can you visit the nearest health facility after suspecting malaria symptoms?

Same day	1
2-3 days	2
After 5days	3

17 Where do you seek medical attention after recognising malaria symptoms?

Private doctor	1
Traditional healers	2
Nearest Clinic	3
Home remedies	4

18 How long does it take to reach the nearest health facility?

<250m-1km	1
2km-4km	2
>5km	3

19 Do you have any knowledge about traditional medicines that can be used to treat (cure) malaria?

Yes	1
No	2

20 If yes list any medicine that you know

……

……

……..

21 Do you know the medicine that is used to treat malaria in clinics/hospitals?

Yes	1
No	2

22 If yes list any medicine that you know

……

……

……

23. Do you know the colour of the medicine used to treat malaria in clinics/hospitals?

Yes	1
No	2
Not sure	3

24 If yes write down the colour of malaria treatment that you receive from clinics/ hospital

	1
	2
Not sure	3

SECTION C: Malaria prevention practices

26 which methods do you use to prevent malaria in your household list any 3

……

……

……

……

……

27 Does the government provide indoor residual spraying of houses?

Yes	1
No	2
Not sure	3

28 If yes to the above question do you allow them to spray your houses?

Yes	1
No	2

29 If no, describe reasons that influence your decision

……

……

……

……

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30 Apart from spraying of houses, what extra activities do you do in your household to prevent and reduce malaria? List as many as you can.

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