ASSESSMENT OF THE KNOWLEDGE, ATTITUDE AND PRACTICES RELATED TO THE TREATMENT AND PREVENTION OF LYMPHATIC FILARIASIS AMONG THE ADULT RESIDENTS OF BOKKOS, LOCAL GOVERNMENT AREA OF PLATEAU STATE, NIGERIA

BY

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DECLARATION

I declare that the work in the thesis entitled "Assessment of the knowledge, Attitude, and Practice of Lymphatic Filariasis among Residents of Bokkos Local Government Area of Plateau State, Nigeria" has been performed by me (Azzuwut Martin Polycarp) in the Department of Community Medicine under the supervision of Dr. M.N. Sambo of the Department of Community Medicine, Ahmadu Bello University Zaria in the year 2011. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this project report/thesis was previously presented for another degree or diploma at any University.

______________________________ ______________________

Azzuwut Martin Polycarp **Date**

CERTIFICATION

This thesis entitled **"ASSESSMENT OF THE KNOWLEDGE, ATTITUDE AND PREVENTIVE PRACTICES OF LYMPHATIC FILARIASIS AMONG ADULTS RESIDENTS OF BOKKOS LOCAL GOVERNMENT AREA OF PLATEAU STATE, NIGERIA"** by **AZZUWUT, Martin Polycarp** meets the regulations governing the award of the degree of Master in Public Health of Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This project is dedicated to Almighty God for making it possible for me to undertake this programme; and to my family especially my wife, Lydia and kids Fatmun, Emmanuella, Marvel and Jason. I also dedicate this work to my dear parents, Mr. and Mrs. Polycarp Ayinda Azzuwut.

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SUMMARY

Lymphatic filariasis is a global Public Health problem with eighty-three countries endemic for the disease. There are approximately 1.1 billion people at risk for contracting it and 120 million people are infected world- wide. The disease is the second most common vector borne parasitic disease after malaria. It is also the second most common cause of long term disability after mental illness. Plateau state Nigeria, with a population of about 3 million people has 17 Local Government areas that are all endemic for the disease. The carter centre established a lymphatic filariasis elimination programme covering the 17 LGAs in 2000. This involves mass drug administration with invermectin/albendazole, vector control, morbidity management and health education. The main objective of this study was to assess the knowledge, attitude and preventive practices related to the treatment and prevention of lymphatic filariasis among the adult residents of Bokkos Local Government Area of Plateau State, Nigeria. The specific objectives included; Assessment of the knowledge of the people regarding the cause, transmission, clinical presentation and prevention of lymphatic filariasis. The study was a descriptive cross-sectional one. The study has shown that most of the residents are knowledgeable about lymphatic filariasis. More than half of the respondents knew that mosquitoes transmit the disease and majority of them know the clinical presentation, prevention and treatment of the disease. Information about L.F and MDA was received mainly from health personnel. There was a high treatment coverage (82.45%) mostly achieved through house to house distribution and a 95 % compliance .However, there was a low ownership and utilization of insecticide treated bed nets. There is need to strengthen health education and the distribution mechanism. The importance of daily usage of ITNs must be heightened through community based education campaigns.

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ACRONYMS

ANC	-	Antenatal care
B. Malayi	-	Brugia malayi
CFA	-	Circulating Filarial Antigen
CT Scan	-	Computed axial tomography
DEC	-	Diethyl cambamazine
FGDs	-	Focus Group Discussion
GAELF	-	Global Alliance for the Elimination of Lymphatic Filariatis
GPELF	-	Global Program to Eliminate Lymphatic Filaritis
ICT	-	Immunochromotographic Test
ITNs	-	Insecticide Treated Nets
IUs	-	Implementation Units
KAPs	-	Knowledge, Attitudes and Practices
L.F	-	Lymphatic Filariatic
LGA	-	Local Government Area
MDA	-	Mass Drug Administratioin
MRI	-	Magnetic Resonance Imaging
PCR	-	Polymerase Chain Reaction
PELF	-	Program to Eliminate Lymphatic Filariatis
PHC	-	Primary Health Care
RAP	-	Rapid Assessment Procedure
W. Bancrofti	-	Wucherevia bencrofti
WHA	-	World Health Assembly
WHO	-	World Health Organization

CHAPTER ONE

INTRODUCTION

The term "lymphatic filariasis" covers infections with three closely related nematode worms- wuchereria bancrofti, Brugia malayi and brugia timori. All three infections are transmitted to man by the bite of an infected mosquito through the skin.[1] These larvae then migrate to the lymphatic vessels and develop into adult worms, over a period of six to twelve months, causing damage and dilatation of the lymphatic vessels. The filariae live for several years in the human host. During this period they produce millions of immature microfilaria that circulate in the peripheral blood and are ingested by mosquitoes when they bite infected humans. The larval forms further develop inside the mosquitoes before becoming infectious to man. Thus a cycle of transmission is established.[2,3,4]

Lymphatic Filariasis is a global Public Health problem with eighty-three countries endemic for the disease. There are approximately 1.1 billion people at risk for contracting lymphatic filariasis and 120 million people are infected world-wide. [5] The disease is the second most common vector borne parasitic disease after malaria. It is also the second most common cause of long term disability after mental illness. One third of infected people live in India, one third in Africa, the remainder live in the Americas, the Pacific Island, Papua New Guinea and S.E. Asia.[6]

Four countries- India, Indonesia, Nigeria and Bangladesh account for 70% of all Lymphatic filariasis. infections. Nigeria is the third most endemic country in the world for the disease, with an estimated 22 million cases. Estimates of annual economic loss in India due to the disease approach 1 billion U.S. dollars; the economic impact in Nigeria is unknown but expected to be significant.[7]

In communities where the disease is endemic as many as 10 percent of women can be affected with swollen limbs and 50 percent of men can suffer from mutilating genital symptoms.[8] Filariae are responsible for a variety of clinical manifestations including lymphoedema of the limbs, genital disease (hydrocele, chylocele and swelling of the scrotum and penis) and acute recurrent secondary bacterial infections known as “acute attacks”. The vast majority of infected are asymptomatic but virtually all of them have sub-clinical lymphatic damage and as many as forty percent have renal involvement with proteinuria and haematuria.[9]

Males are usually more frequently affected than females. This higher incidence of microfilariaemia in males is probably due to a greater chance of infection; it is possible, however, that a hormonal influence may be responsible. Most surveys for either form of W. Bancrofti have shown low microfilaraemia rates in children below the age of five years, probably because W. bancrofti takes a long time to produce a patent microfilaraemia. In contrast it has been shown that higher microfilarial rates occur in children under five years with both forms of B. Malayi: thus a low infection rate among children under 5years usually implies low transmission for B. Malayi in the area surveyed.[10]

About 40 million persons world-wide suffer the devastating clinical manifestations of the disease.[10] Only a small proportion of infected individuals, however, exhibit clinical signs. The disease manifestation is divided into two distinct types (a) lymphatic filariasis and (b) occult filariasis. The clinical manifestation may include lymphoedema, hydrocele, lymph scrotum, Tropical Pulmonary Eosinophilia (TPE), adenopathy, haematuria. Elephantiasis may affect the legs, scrotum, arms, penis, vulva and breasts usually in that order of decreasing frequency. [1]

Globally, an estimated 16 million persons suffer from lymphoedema in filariasis endemic areas of the world with 27 million people suffering from accumulation of fluid in the tunica vaginalis. The earliest onset of lymphoedema in endemic areas is usually observed around the time of puberty and the prevalence increases with age. Lymphoedema of the legs is more common in women than men.[9]

The burden and/or impact of the disease on the community is multi dimensional.[6] There are negative social impacts[11,12,13]: lowered quality of life of affected individuals. Stigmatization is directly correlated with the severity of condition[14]; unmarried affected women have limited marriage prospects and make them a burden to their families. Physical and psychological burden has a negative impact on marriage and employment prospects. The condition has also impacted negatively upon lifestyle and economic activities.

The fiftieth World Health Assembly on 13th May 1997 deeply concerned at the widening spread and increased distribution of lymphatic filariasis throughout the world in both rural and urban areas and concerned that it affects all ages and both sexes, decided that the disease should be eliminated as a public health problem. [15]

Elimination of the disease means a reduction in incidence close to zero as a result of deliberate effort requiring continued and coordinated activities. WHO's strategy requires two components:-

a. Interruption of transmission through mass drug administration (MDA) once a year for at least five years or until the transmission has been interrupted:

   6 ml/kg diethylcarbamazine (DEC) + 40mg albendazole or 150ug/kg / ivermectin + 400 mg albendazole or a treatment regimen using DEC fortified cooking salt daily for a period of 6-12 months

b. Care for those who already have the disease.

Although vector control is not advocated as an operational component, the programme encourages its application as part of other on-going integrated vector control activities.

In the year 2000 under the leadership of WHO, the Global Alliance for Elimination of Lymphatic Filariasis (GAELF) emerged with the goal to eliminate lymphatic filariasis (LF) as a Public Health menace by the year 2020. The GAELF consists of Ministries of Health of endemic countries, donor pharmaceutical companies, involved universities, Governments of United Kingdom, Japan, Spain and Italy, multiple non-governmental organizations and philanthropic organizations. Thus it is a public-private partnership to eliminate the scourge of civilization.[16,17,18]

The efforts of the Global Program to Eliminate Lymphatic filariasis are estimated to have already prevented 6.6 million new cases from developing in children and to have stopped the progression of the disease in another 9.5million people who have already contacted it. Overall, of 83 endemic countries, mass treatment has been rolled out in 48, and elimination of transmission reportedly achieved in 21 countries.[19]

In Africa, of the 46 countries in the region, 39 are lymphatic filariasis endemic. In total about 420 million people are considered to be at risk. Filariasis and onchocerciasis are co-endemic in 28 countries. In Nigeria, 80 million people are at risk of the disease, third behind India and Indonesia with a Pre-MDA baseline circulating filarial antigenaemia ranging from 5% to 64%. Mass drug administration coverage of essential sites is 56.7% in 2001.[20,21]

Plateau State with a population of about 3 million people has 17 local government areas that are all endemic for the disease.[22] A survey of 149 villages in the state in 2002 recorded 90% of the villages had lymphatic filariasis with a mean prevalence of 22.4% (range 0-67%) by blood antigen testing in adult males. [23]A report submitted to the Plateau state Ministry of Health by the Carter Centre showed that in 2004, of 174 people tested by the ICT card test 77 were positive for LF.[24]

The Carter centre, a not for profit, non- governmental organization, was first invited by the Federal Ministry of Health, Nigeria and the State Ministries of Heath of Plateau and Nasarawa States to help establish a lymphatic filariasis Elimination Program in 1998. The aim of the program is to eliminate the disease as a health problem in the two states by 2010 lymphatic filariasis which is widespread in the two states, with all towns and villages needing health education and combined mectizan / albendazole treatments.

Lymphatic filariasis Elimination program intervention is normally preceded by mapping. Mapping of lymphatic filariasis in Nigeria was carried out in only two states- Plateau with seventeen IUs (implementation units or LGAs and Nasarawa with thirteen IUs ((LGAs) with an estimated at risk population of 4.3 million. The pre-MDA prevalence estimated by circulating filarial antigen (CFA) ranged from 5-64%. The first round of MDA under PELF began in 2000 with ivermectin/albendazole and covered 4 IUs. The second round in 2001 covered 13 IUs. In 2002, an at risk population of 2.17 M was covered in 26 IUs in Plateau and Nassarawa States. There was no report of the coverage in comparison with the total population but an estimate of the eligible population was more than 89%.

By 2006 more than 3.2 million persons were treated in 3,677 villages. Health education messages are aired in radio messages in Hausa and English and a television documentary. In addition 9,179 villages' health workers have been recruited or retrained to assist with lymphatic filariasis education and treatments. A pilot survey program for repair of male genitals damaged by lymphatic filariasis (hydrocelectomy) has so far helped over 200 men better their lives.[25, 26]

The Carter centre is collaborating with the Glaxosmithkline, Merck &co, Bill and Melinda Gates Foundation, the Local Governments and the Plateau State Ministry of Health in a Public – Private Partnership. The centre has integrated lymphatic filariasis elimination with that of some neglected tropical diseases- river blindness, schistosomiasis and trachoma. In addition 57,000 insecticide treated nets donated by the Nigerian National Malaria program have been distributed.[26,27,28]

Assessments underway to determine the impact of these interventions have already shown a reduction of greater than eighty percent in lymphatic filariasis in both people and mosquitoes. The significant reduction illustrates the important contribution bed nets can make in the fight against the disease.[29,30,31]

Lymphatic Filariasis Elimination program intervention is normally preceded by mapping.[32] There are many determinants affecting programme outcome-greater or lesser likelihood of success (defined as the rapid and sustained fall in the prevalence of microfilaraemia). Among the most prominent factors to affect programme outcome are:[33]

1. The initial level of lymphatic filariasis endemicity i.e. prevalence and density of microfilaraemia.
2. The competence of vectorial capacity of the local vector.
3. The drug regimen used for the Mass Drug Administration.
4. Both population coverage and population compliance.
5. Operational effectiveness of the programme especially social mobilization, supervision and monitoring.
6. Adequacy of resources (both funding and human).

7. The political commitment to support the program

1.1 JUSTIFICATION

Lymphatic filariasis is a significant public health and economic problem in many tropical and sub-tropical regions. The disease is endemic in all the seventeen local government Areas of Plateau State. It is found in both rural and urban areas. Up to 10-50% of men and up to 10% of women can be affected.

The World Health Assembly in May 1997 resolved to eliminate the disease by the year 2020 through the adopted strategy of mass drug administration, vector control, morbidity management and health education. These intervention strategies have been instituted in the state by the Carter Center.

There is a growing recognition that community involvement and effective health education play a critical role in the success of elimination of lymphatic filariasis and therefore the need to know about the knowledge, attitude and practices of the people towards lymphatic filariasis. The knowledge gap with regard to the disease and prevailing attitude and perceptions towards the programme may be the source of the major causes of lower compliance. Any successful strategy to eliminate the disease must take into account the range of people's knowledge and perceptions for the program to gain wide acceptance.

Moreover, assessment of knowledge, attitudes and practices (KAPs) of a community is one of the rapid assessment procedures (RAPs) in assessing the burden of the disease and the effectiveness of a lymphatic filariasis elimination program.

1.2 THE RESEARCH HYPOTHESIS

The null hypothesis is that the adult residents of Bokkos Local Government Area have poor knowledge, bad attitude and poor practices related to the treatment and prevention of lymphatic filariasis. The alternate hypothesis is that the residents are knowledgeable, have good attitude and practices related to the treatment and prevention of lymphatic filariasis.

1.3 OBJECTIVES OF THE RESEARCH

The main aim of the study was to assess the knowledge, attitude and practices related to the treatment and prevention of lymphatic filariasis among the adult residents of Bokkos local government area of Plateau State, Nigeria.

Specific objectives include:

1. To assess the knowledge of the people towards the cause, transmission, clinical presentation and prevention of lymphatic filariasis.
2. To assess the attitude of the people towards lymphatic filariasis.
3. To assess the practice of the people towards the prevention and treatment of lymphatic filariasis.

CHAPTER TWO

LITERATURE REVIEW

2.1 DEFINITIONS

Lymphatic filariasis is a parasitic and infectious tropical disease caused by infection with the filarial worms, wuchereria bancrofti, Brugia malayi or brugia timori. These parasites are transmitted to humans through the bite of an infected mosquito and develop into adult worms in the lymphatic vessels, causing severe damage and swelling (lymphoedema) Elephantiasis – painful, disfiguring swelling of the legs and genital organs is a classic sign of late stage disease.[2,28,30]

In most endemic regions, microfilaria show peak abundance in the human bloodstream between 10pm and 2am, which corresponds with the time when culex mosquitoes are most active. In some regions of the South Pacific, however, where the vectors of filariasis are active primarily in the daytime, microfilariae are most abundant during the day. These observations are consistent with the hypothesis that the microfilariae abundance cycle in the bloodstream has evolved to maximize transmission to mosquitoes.[3]

Some factors are important in the endemicity and prevalence of lymphatic filariasis in a community:

A. **Environmental factors**:

i. Climate is an important factor. Temperature of between 22^{o}C and 38^{o}C and a humidity of 70% is ideal for prevalence and longevity of culex mosquito, a vector for the disease.

ii. Poor drainage allows for profuse breeding of vectors in polluted water.

iii. Poor town planning encourages breeding of mosquitoes in cesspools, soak away pits, drainages, open ditches, etc.

B. Host factors: Migration of people from one place to another has led to the extension of filariasis into areas previously non-endemic including urban areas. The disease has increased in frequency with a global expansion of urbanization and the consequent increase in breeding sites for vector mosquitoes such as culex pipiens.[3,4]

C. Social factors: The disease is associated with industrialization, urbanization, migration of people, illiteracy, poverty and poor sanitation.

2.1.1 History

Lymphatic filariasis is thought to have affected humans since approximately 4000 years ago. Artifacts from ancient Egypt (2000 BC) and the NOK civilization in West Africa (500 BC) show possible elephantiasis symptoms. The first clear reference to the disease occurs in ancient Greek literature, where scholars differentiated the often similar symptoms of Lymphatic filariasis from those of leprosy.[8]

The first documentation of symptoms occurred in the 16th century, when Jan Huyghen Van Linchoten wrote about the disease during the exploration of Goa.[8] Similar symptoms were reported by subsequent explorers in areas of Asia and Africa, though an understanding of the disease did not begin to develop until centuries later.[8]

In 1866, Timothy Lewis, made the connection between microfilariae and elephantiasis, establishing the course of research that would ultimately explain the disease. In 1876, Joseph Bancroft discovered the adult form of the worm. In 1877, the life cycle involving an arthropod vector was theorized by Patrick Manson, who proceeded to demonstrate the presence of the worms in mosquitoes. In 1900, George C. Low determined the actual transmission method by discovering the presence of the worm in the proboscis of the mosquito vector.[8]

2.1.2 Geographical distribution

Lymphatic filariasis occurs in the tropics of India, Africa, Southern Asia, the Pacific and Central and South America. The largest fraction of cases occurs in South East Asia, with the second largest fraction occurring in Africa. The disease has increased in frequency with a global expansion of urbanization: Urbanization brings an increase in breeding sites for mosquito vectors.

Four countries - India, Nigeria and Bangladesh accounts for 70 percent of all lymphatic filariasis infections. Nigeria is the third most endemic country in the world for the disease, with an estimated 22 million cases.[28] South East Asia countries have the highest number of people at risk of the disease (851 million) 554 million of whom are in India alone. Africa region has the second largest number of people at risk (at least 394 million). Of the 83 lymphatic filariasis endemic countries in the world 39 are in Africa (i.e. 47%).[5] More than 13 billion people approximately 18% of the world's population live in areas at risk of infection. Other countries among the most highly endemic countries include the Democratic Republic of Congo and Madagascar.

There are suggestions that the global overall prevalence of filariasis is 2% (approximately totaling 119 million cases). In the Western Pacific region, Papua New Guinea is the country with the greatest remaining burden of clinical and subclinical lymphatic filariasis (with lymphatic filariasis antigen prevalence rates of 100% by Immunochromatographic card test method in some areas).[34]

In Africa, the disease is widespread. In Benin Republic, endemic areas had microfilaraemia prevalence of 10%.[35] In Ghana, a study by Gyapong *et al*. 1993-1994 showed an average microfilaraemia prevalence of 41%. Gyapong et al in 1995 found that 12.6 % of compounds visited (795 out of 5846) had at least one resident compound member with visible or reported elephantiasis of the leg and hydrocelectomies accounted for more than 20% of all surgery done in a regional hospital.[36] In Malawi, thirty- five villages sampled from 23 districts, antigenaemia prevalence based on immunochromatographic card test (ICT) ranged from 0% to 35.9% with some villages recording 80%. There was also a high prevalence of LF associated diseases (4% lymphoedema and up to 18% hydrocele.[37] In Sierra Leone, LF is co- endemic with onchocerciasis and schistosomiasis. The disease is highly endemic throughout the country with prevalence rates of >10% in high prevalence areas.[38]

In Uganda, the prevalence of circulating filarial antigen positivity is 18-20% while microfilarial prevalence is 9-12%.[39]

Nigeria has the third largest number of people infected with LF in the world, preceded only by India and Indonesia. Nearly one in four Nigerians are infected with wuchereria bancrofti. The geographical distribution of the disease appears to show a gradient increasing from the north to the south in the country coincident with increasing tropical climate.[40]

In the Niger Delta, Eastern Nigeria, of 3400 people in 34 villages examined, 421 (12:38%) had w. bancrofti microfilaraemia. More male (15%) were infected than females (9-10%). The prevalence was age dependent with a progressive rise and decline after 59 years.[41]

In Benue, results of an epidemiological mapping undertaken between December 2004 to February 2005 indicated an overall lymphatic filariasis antigen prevalence (using ICT whole blood tests) of 6.5% recorded in 65% of 20 communities from the 18 LGAs. The result indicates that LF is widely distributed in the State. [42]

In Plateau and Nasarawa States, LF is co-endemic with onchocerciasis and schistosomiasis. A survey in 2002/2003, 3.6% had positive microfilariae tests while 4-62% had positive antigenaemia.[43] In Akwanga local Government Area of Nasarawa State, of 108 villages sampled, 95.2% showed evidence of infection (by ICT method) with 36.1% of villages showing prevalence of 25% or greater. 89.5% of 88 villages surveyed in Pankshin LGA of Plateau State showed evidence of infection (by ICT method) with 47.4% of villages showing prevalence of 25% or greater.[23,25.] Estimates by age and gender suggests that it is mainly a diseases of the adult and older age classes and appears to be more prevalent in women with high social stigma, social discrimination and divorce associated with the disease.[44,45]

The disease is not limited to rural areas. In Recife, an urban area of Brazil, microfilaraemia prevalence reaches 14%, males having a higher prevalence. Prevalence of microfilaraemia was reported to be higher in the 15-24 and 25-34 age groups in both sexes. In Jos, the major urban population centre of Plateau State, Nigeria. Filarial antigenaemia among 98 people tested was found to be 6.1% in a clinic based surveillance.[46,47]

Transmission of L.F results from parasitic worms transmitted by the bites of infected mosquitoes in tropical and subtropical regions of the world. Several species of mosquitoes can transmit the disease, but in rural Africa, the anopheles mosquito is the primary carrier. An infected mosquito deposits microscopic larvae while biting a person, and the larvae migrate to the human lymph system where they mature into adult worms.

In the lymphatic system, adult worms mate and form nests, which cause blockages resulting in fluid collection, swelling and fever- Adult worms live for about five to seven years. Female worms produce millions of microfilaria which swim in the blood. When a mosquito bites a person who has L.F, it ingests the microfilariae and becomes infected. While inside the mosquito, the microfilaria develop over a period of a week into infectious larvae and the cycle continues.[48]

W. bancrofti transmission is largely determined by geo-environmental variables. Environmental conditions are widely conducive to transmission efficiency: human factors are also key determinants contributing to the local occurrence of filariasis. Geo-environmental variables (physiographic and climatic): Physiographic factors mainly contribute to vector abundance whereas the climatic factors influence the extrinsic incubation of parasites directly as well as via vector survival. The geo- environmental factors are: altitude, temperature, relative humidity, type and land use/land cover. The human factors include population density, movement, economic status, occupation, literacy level, health seeking behaviour and other human activities.[49]

2.1.3 Diagnosis

A polymerase chain reaction (PCR) assay has previously been developed to amplify the Ssp 1 repeat region on the W. bancrofti genome, providing a highly sensitive method for detecting W. bancrofti DNA in both individual and pooled mosquitoes and allows for a greater number of mosquitoes to be processed at one time. As transmission rates approach zero after several years of annual mass drug administration (MDA), performing PCR assays on mosquito pools can provide a cost effective highly sensitive and specific way to monitor decreasing levels of transmission and it has also been proven to successfully estimate local levels of transmission of LF expressed in rates of vector infection.

In addition, monitoring changes in mosquito infection rates can produce a timely index of transmission dynamics, as changes in infection patterns in humans could take years to detect.[48,50]

PCR detection of infections in mosquitoes is much less labour intensive and tedious than dissection but the cost of identifying infection in each infected fly is prohibitive if large numbers of mosquitoes are to be examined therefore a pool of mosquitoes should be used.

Filariasis is usually diagnosed by identifying microfilariae on a giemsa stained thick blood film and by counting chamber technique. Blood must be drawn at night because of nocturnal periodicity.

Others: Lymphnode aspirate, chylus fluid may also yield microfilariae

- Imaging like CT scan, MRI may reveal "Filarial Dance sign" in chylous fluid. X-ray can show calcified adult worm in lymphatics.
- Eosinophilia is a non specific primary sign.[8]

However, an antigen-detection test that is specific, simple and sensitive- the immuno chromatographic card test (ICT) is available and can detect infection within minutes and can be carried out at any time of the day.

Chronic clinical manifestation of lymphatic filariasis like hydrocele, limb elephantiasis, etc can be used.[39,51,52]

2.2 ELIMINATION OF LYMPHATIC FILARIASIS

In May 1997, the world Health Assembly (WHA) passed a resolution calling for the global elimination of lymphatic filariasis (LF) as a global health problem (WHA 50.29).

The World Health Assembly (WHA) adopted a resolution supporting the global programme to eliminate lymphatic filariasis and a twenty year programme is now underway: Global program to eliminate lymphatic filariasis (GPELF). Twin pillars of LF elimination program have been identified: controlling morbidity and interrupting transmission. Elimination of lymphatic filariasis as a public health problem is feasible and will require a dual approach. First program at local, national and global levels must relieve current suffering. Second, these programs must interrupt transmission to prevent disease in future generations. Relief of suffering will need to be a critical component of lymphatic filariasis elimination programs because interruption of transmission alone has no short term effect on the prevalence or incidence of chronic disease particularly elephantiasis of the leg and advanced urogenital disease, and because addressing the needs of these already affected enhances community acceptance and participation in the program.[53]

Interruption of the transmission can be achieved through

a. Chemotherapy
b. Vector control: there are three main reasons why filariasis never causes explosive epidemics:
    1. The microfilariae does not multiply in the vector.
    2. Infective larvae do not multiply in man.
    3. Life cycle of the parasite is relatively long.

Case detection and treatment in low endemic areas are suitable for preventing transmission and controlling disease. In high endemic areas, mass chemotherapy is the approach.

Diethycarbamazine (DEC) salt is also a form of mass treatment using low dose of drug over a long period of time (1-2 gm/kg of salt)

Vector control

This involves antilarval measures, anti adult measures and personal prophylaxis. An integrated method using all the vector control measures alone will bring about sustained vector control.

i. **Antilarval measures**

1. **Chemical control**
   a. Mosquito larvicidal oil
   b. Organophosphorous compounds such as Temephos, Fenthion
   c. Pyrosene oil
2. **Removal of Pistia plants**
3. **Environmental measures**

ii. **Anti Adult Measures**

These include in-door residual spray using DDT, dieldrin, Pyrethrium as a space spray.

iii. **Personal Prophylaxis**

Reduction of man-mosquito contact by use of mosquito nets, screening of houses, mosquito repellants, etc.

Morbidity Management

Control Morbidity (relief of suffering). This involves community level care of those with disease: Lymphoedema, acute inflammatory attacks, hydrocele repair etc.[54]

Lymphatic filariasis elimination as a public health problem is defined as:

a) Microfilaraemia rate < 1%
b) Evidence that there is no new parasitic infection in the community i.e. 5 years cumulative incidence in children born in a given implementation unit (IU) after the start of MDA is less than 1 per 1000 children.

To interrupt transmission, districts in which L.F is endemic must be identified and then community-wide ("Mass treatment") programs implemented to treat that entire at risk population. In most will be based on once-yearly administration of single doses of drugs given together: Albendazole plus either diethylcarbamazine (DEC) or 'ivermectin', the latter in areas where either onchocerciasis or loasis may also be endemic; this yearly single dose treatment must be carried out for 4-6 years. An alternative regimen with equal effectiveness is DEC fortified cooking salt. To alleviate the suffering caused by the disease, community awareness, programs to raise awareness in affected patients is necessary.

The World Health Organization is collaborating with Smith Kline Beecham (albendazole donation) Merck and co Inc (Mectizan or ivermectin donation) and the creation of other additional partnerships with private, public and international organizations, including the World Bank to strengthen the prospects for the success of the elimination efforts.[2]

2.3 EVALUATION OF A PROGRAM TO ELIMINATE LYMPHATIC FILARIASIS

Any program to eliminate lymphatic filariasis can be evaluated using the following methods:

a. Filarial antigenaemia: The pre-mass drug administration (MDA) antigenaemia and the Post MDA antigenaemia are compared. Rounds of MDA should have a dramatic effect on the overall filarial antigenaemia prevalence. A survey in Vanuatu showed a 30-fold difference in positivity between filarial antigenaemia and microfilaraemia soon after the MDA program.

b. Filarial antibody tests ($Ig\ G_1 + Ig\ G_4$): Studies have shown that filarial antibodies develop early in life where there is active transmission of the parasite. Very low level of antibody positivity provides evidence that L.F transmission is likely to have ceased. Screening of school children can confirm the programs success in interrupting transmission.

c. Microfilaraemia: Lack of microfilaraemia provides evidence that transmission has ceased.

d. Entomological assessment: Lack of filarial infection in collected mosquitoes provides evidence that transmission has ceased.

Others:

i. MDA coverage of greater than 70% is likely to interrupt transmission.

ii. Bed net usage: A large percentage of people surveyed should be using insecticide treated bed nets as this aid in vector control.

iii. Knowledge, attitude and Practices, towards L.F. There should be high level of community participation in the MDAs. The people should also have a good knowledge about the etiology, signs and symptoms, treatment and prevention of the disease.[49,55,56]

2.4 ASSESSMENT OF KNOWLEDGE, ATTITUDES AND PRACTICES

Many studies have been conducted to assess knowledge, attitude and practices towards, lymphatic filariasis. Gyapong J.O et al in a survey in Ghana reported that focused group discussions and the use of questionnaires can be used as rapid assessment procedures for the community diagnosis of lymphatic filariasis The use of self administered questionnaires provided data comparable with data on elephantiasis in the community from a case search.[57]

The role of mosquitoes in transmitting the parasitic agents of filariasis is poorly appreciated in many endemic communities, and thus, it is not surprising that there is little awareness in these areas of the importance of minimizing mosquito contact for preventing infection.[58] In a Malaysian study, only 9 out of 108 respondents associated filariasis with mosquitoes, while walking barefoot on dirty ground or consuming contaminated food and drink was commonly implicated as the source of infection.[2] In rural Thailand, while school children indicated correctly that mosquitoes transmit filariasis and that the disease could be prevented by personal protection against mosquito bites, adults maintained that the disease was inherited or resulted from poor circulation, carrying heavy loads, prolonged standing, bathing in or drinking swamp water, personal contact with infected individuals or sorcery.

In Papua New Guinea and the United Republic of Tanzania, although most people indicated that mosquitoes spread malaria, few understood that mosquitoes could also spread filariasis.[60] In the Philippines correct knowledge of disease transmission was associated with highest level of formal educational attainment. A study in rural South India found that only 9% of apparently uninfected people and 20% of patients with chronic filarial pathology knew that filariasis was contracted through mosquito bites; the rest attributed it to many other causes.[59]

In a KAPs survey in an endemic area of Haiti only 6% of those interviewed knew that lymphatic filariasis was caused by mosquitoes. Hydrocele was thought to be caused by trauma (60%), or trapped gas (30%); elephantiasis by walking barefoot on soil or water (37%) or by use of ceremonial powder that had been sprinkled on the ground (23%). Of 76 respondents, 53% and 38% thought that hydrocele could be treated through surgery or a drug, respectively, whereas, 86 respondents, 85% and 15% believed that either surgery or a drug could be used to treat elephantiasis. Responses were influenced by age, sex and symptoms, but none of these effects were statistically significant.[60]

In a study in Nepal, of the total respondents (1,754 out of 4,488 individuals included in the study), 49.3% said that filariasis was caused by mosquito bites, 15% mentioned flies and insects, 5% blamed poor weather, 5.6% poor living status, 7.5% believed that evil spirits were responsible and 9.6% did not know. Treatment seeking behaviours ; 30% consulted traditional healers, 38% modern medicine practitioners; 22% used herbal medicine for self treatment and 10% did not seek treatment.

Use of bed nets: 40% of the respondents mentioned that they used bed-nets in their household. Based on the questionnaire, there was no significant difference between bed nets users and non-users with regards to the clinical signs of filarial disease. [61]

In Coastal Orissa, India, a study revealed that Basic knowledge on lymphatic filariasis was poor as only one third of respondents knew that mosquito bite is the cause of elephantiasis. Relatively low proportion of people knew that LF can be eliminated by taking medicine. [62]

A study in a rural community in Kerala, India showed that 20.9% of 599 respondents believed that mass drug administration (MDA) prevented the occurrence of filariasis. Most (62.3%) said they obtained information about MDA from television or radio programmes and or newspapers and most (66.3%) considered it to be useful. Those who had not ingested the tables given to them during the last MDA said they were fearful of the drugs (39.4% of the non-compliers), were too ill to take the drug (22.5%) or had misconceptions about the aims of MDA (12.5%). Only 2.7% of respondents who had ingested the distributed drugs reported adverse effects and these were mild (fever, drowsiness, swelling/oedema and/or vomiting).[63]

In some studies, women and men with lymphatic filariasis disease were reported to have limited marriage prospects thereby making them a burden to their families. In Thailand

and West Africa there is a general perception that children born to a woman affected by lymphatic filariasis will be similarly affected.[58]

In a study in Haiti, only 6% of those surveyed knew that lymphatic filariasis was transmitted by mosquitoes. In contrast, all the people knew of the clinical conditions of hydrocele and elephantiasis. Of 76 respondents, 53% and 38% thought that hydrocele could be treated through surgery or drug respectively, whereas of 86 respondents, 85% and 15% believed that either surgery or a drug could be used to treat elephantiasis.[60]

In a KAPs survey in Alor District, Indonesia, Pre-MDA 21% reported having previously taken the treatment for filariasis, while post –MDA, 88% reported having taken the treatment during the pilot treatment period.[64]

A study in Gudiapokhari, Puri district of India by G.K Padhy et al showed that of 170 respondents only 160(93.9%) had received drugs distributed during MDA and 106(66.25%) consumed them and 54 or 33.7% did not consume. Reasons for non-consumption were: 34(62.9%) were afraid of side effects, 14(25.9%) felt the drugs, to be unnecessary as they themselves do not suffer from L.F disease, 6(or 11%) were unaware of program.

Primary reason given for failing to receive medicine were non-coverage of the area by distributor in 60% and absenteeism during MDA distribution in 40%.[65]

In a similar study involving 7168 respondents in Filaria endemic districts of Andra Pradesh, India by Mukhopadhyay A.K and colleagues only 1204(16.8%) had mosquito nets in their homes with only 9.0% sleeping under mosquito nets daily. Just 5015 of the respondents, (69.9%) received MDA drugs with only 3242(64.64%) of the number actually consuming the drugs.[66]

In a KAP study in rural Southern Malawi, knowledge on the cause of hydrocele and lymphoedema was low in all the sentinel Sites (16-42%, 10-24% respectively). Sexual intercourse with a menstruating woman, bad weather and HIV/AIDS were perceived causes of Hydrocele).[67] In a study in Ethiopia, ITNs mean utilization based on history of sleeping under nets in the previous night was 81.6%. Majority of respondents (85.7%) used nets daily.[68]

In Kenya, treatment coverage (percentage of respondents who reported to have received and swallowed the drugs (tablets) was reported by Njeri Wammae et all to be 46.5% and 88%. Coverage was the same for both males and females and there was not much variation by age.[69]

In Nigeria, several surveys have been conducted. A study among the Igede ethnic group in Benue State, Nigeria, 7.9% had clinical manifestation of the disease (hydrocele and lymphoedema) and those who had the disease were more knowledgeable than unaffected ones. [70] In Lau Local Government Area, Taraba State Nigeria, a low perception of personal susceptibility to lymphatic filariasis was identified among the people. The study also found that very few people associated lymphatic filariasis with Mosquito bites. 97% of the people indicated willingness to take part in MDA for the control of the disease.[71] In Etsako West LGA, Edo State, Nigeria, ownership and use of ITNs among pregnant women attending ANC were very low, 9.3% and 8.0% respectively. The main reason being the non-availability of ITNs.[72]

A survey conducted in five malaria holo-endemic communities in Enugu State, South Eastern Nigeria found out that of the respondents only 14.0%, 15.7%, 9.6%, 8.0% and 50.3% (in orba) had ever purchased any type of mosquito nets.[73]

A study in Benue state, Nigeria by Omudu and colleagues revealed preference of traditional medicine over modern medicine by L.F disease patients.[74]

In a study in Pankshin and Akwanga LGAs in Plateau and Nasarawa States respectively it was found that the community members generally were aware of the manifestation of lymphatic filariasis (hydrocele and leg swelling). There were many misconceptions as to the causes, however, and none knew that these manifestations were due to parasite transmitted by mosquitoes. Some attributed hydrocele to adultery for example. Affected persons themselves sought both traditional and modern medical remedies.[75]

CHAPTER THREE

METHODOLOGY

3.0 STUDY AREA

Bokkos Local Government Area is located in the Central zone of Plateau State, Nigeria and it is one of the 17 LGAs in the state. It was created in 1991 out of the then Mangu LGA. Its headquarters is Bokkos which is 77 kilometers from Jos, the state capital. The L.G.A shares boundaries with Qua'an Pan LGA to the south, Barkin-Ladi to the North, Sanga LGA of Kaduna State and Wamba LGA of Nassarawa state to the West and Mangu LGA to the East.

Though situated in the tropical zone, a higher altitude means that the local Government Area has a near temperate climate with an average temperature of between 18^oC and 22^oC. Harmattan winds cause the coldest weather between December and February. The warmest temperature usually occurs in the dry season months of March and April. The mean annual rainfall is 146cm (57in). The highest rainfall is recorded during the wet season months of July and August.

Bokkos, the LGA capital is a semi-urban settlement and is the biggest. The other settlements are rural. People live largely in lowland areas in dispersed settlements and compounds usually unfenced.

As a result of active participation of government, private individuals and voluntary agencies in the health sector, Bokkos LGA is reasonably well covered with health facilities. There are eighty-four health facilities in the LGA. This is made up of three secondary health facilities and eighty one PHCs .There is a State Government owned cottage hospital located at Bokkos town. This provides secondary health care services. Primary Health facilities provided by the local Government are the most ubiquitous and are found in all the wards. The services provided include the treatment of common diseases and routine immunizations. Private individuals, the Non-Governmental Organizations have also provided dispensaries, maternal and child welfare clinics, health centres and medical centres for the people.

The Local Government Area has a 2011 projected population of 206,877 people. The LGA is largely rural and the people are mainly farmers. The predominant religion is Christianity. The Local Government area is heterogeneous with many ethno-linguistic groups. The following are the major ones: Ron, Kulere and Mushere. People from other parts of the state and the country have come to settle in the Local Government Area like the Igbo, Yoruba, Hausa, Fulani, Berom, Mwaghavul etc. Each ethnic group has its own distinct language but as with the rest of the country, English is the official language. Hausa is also a medium of communication and commerce as is the case in most parts of the North and Middle belt of Nigeria. The people are predominantly Christian and predominantly farmers and have similar cultural and traditional ways of life. The local Government Area is divided into twenty (20) political wards.

The Local Government Area is supplied by the Nigerian Electricity Company (NESCO) which generates its electricity from Kura Falls. Most of the wards have no electricity supply.

A state road links the Local Government to Barkin Ladi. A federal road is being constructed to connect the area to Wamba in Nassarawa State and Panyam in Mangu Local Government Area. The state radio and television stations cover the LGA. Nasarawa State frequency modulated (FM) radio station is also widely listened to.

Lymphatic Filariasis is endemic in the Local Government Area. The disease is co-endemic with onchocerciasis. Mass drug Administration (MDA) for LF began in the state in 2000 and involved all LGAs in the state by 2002. Population based prevalence surveys and spot checks after six years of MDA were conducted by the Carter Foundation in 2009.

3.1 STUDY POPULATION

Males and females aged fifteen (15) years and above resident in Bokkos LGA.

Inclusion Criteria: Adult males and females aged fifteen years and above who are permanent residents of the ward. Those who have lived for six months or more in the area were selected to avoid misrepresentation and generalization of study results to people outside the zone.

Exclusion criteria: Those coming from outside the ward or staying temporarily. Those who did not want to participate in the study were also excluded.

3.2 STUDY DESIGN

The study was a descriptive cross-sectional study.

3.3 SAMPLE SIZE DETERMINATION

The sample size (n) was calculated using the formula:-

$$n = \frac{Z^2pq}{d^2}$$

n = desired sample size

z = standard normal deviate set at 1.96 which corresponds to the 95% confidence interval.

p = The proportion in the target population estimated to have a particular characteristic.[24] = 0.442

q = 1 – p, (1 – 0.442 = 0.558)

d = degree of accuracy desired

$$n = \frac{(1.96)^2 (0.442) (0.558)}{(0.05)^2}$$

$$= \frac{3.84 \times 0.246}{0.0025}$$

$$= 378$$

Total Sample Size = Sample Size PLUS 10% to give room for non- response rate

$$= 378 + 38$$

$$= 416$$

3.4 SAMPLING TECHNIQUE

Multistage sampling technique was used. First stage: the four wards were selected out of the twenty in the LGA. Second stage: one village was selected from each of the wards. All villages in selected wards were listed and one randomly selected from each ward by balloting. Systematic random sampling technique was then used to select the houses. All houses in the selected village were numbered and mini census was done to know the number of people in the area who met the inclusion criteria. This was then divided by the expected sample size (104) to get a sampling fraction and sampling interval. In each house all the people that fulfill the criteria were interviewed.

3.5 DATA COLLECTION TECHNIQUE

This was done using both qualitative and quantitative techniques. Community members aged fifteen (15) years and above were recruited. This was because manifestations of L.F disease occur much later in life.

Quantitative method

Collection of data was done using structured, closed-ended, interviewer administered pre-tested questionnaires. Eight interviewers, four males and four females who are fluent in the local languages spoken in the selected wards were recruited and trained to administer the questionnaires. Equal allocation of one hundred and four (104) subjects were selected from each of the four wards to make a sample size of four hundred and sixteen (416) respondents.

Qualitative method

For the qualitative method it was through focus group discussions (FGDs) organized in all the selected wards and only community members aged fifteen (15) years and above were recruited .This was to ensure that the respondents properly understood the questions. Eight sessions of focus group discussions were held. Each group was homogenous, made up of young females aged 15-30 years, older females > 30 years of age, young males 15-30 years of age and older males > 30 years of age. Each group was made up of ten people and each session lasted for about two hours.

For the FGDs, the participants were brought to a convenient place in their ward, which was acceptable to all participants. The FGDs had a moderator, a note taker who was also present to note the list of issues discussed and the reactions and responses of the participants. A team member who also monitored the entire process recorded the entire discussion on an audiocassette. Before concluding the discussion, short personal information was obtained from all the respondents. The moderators were provided with a discussion guide, consisting of relevant core questions/issues that were posed to all groups. The questions were on knowledge, attitude and practices of lymphatic filariasis.

Quantitative method: The interviewers administered the questionnaires to the selected respondents. Information collected included demographic characteristics of the respondents e.g. age, sex, religion, tribe, occupation, village, educational qualification etc. Other information include: knowledge of etiology and symptoms of filariasis, whether people understood the relationship between infection and disease, recognition of the role mosquitoes play in transmission, willingness of the community to participate in a control programme, acceptance and utilization of insecticide treated bed nets, comment on prevalence of lymphatic filariasis in the community, pre and post MDA.

3.6 DATA ANALYSIS

Information collected were fed into Statistical Package for Social Sciences (SPSS Version 17) for analysis and presented using bar charts, pie-charts, frequency tables and percentages. Chi-square test was used to test statistical significance of relationship between variables. Core issues from the focused group discussions were also highlighted.

3.7 ETHICAL CONSIDERATIONS

Permission was secured from department of Community Medicine, Faculty of Medicine, Ahmadu Bello University, Zaria and the state ministry of health before the collation of data from the Carter Centre and before the administration of questionnaires. Consent was also sought from the Local Government chairman and village/ward heads. Informed consent was also sought and obtained from each respondent before administering the questionnaire. All information acquired was treated with utmost confidentiality.

3.8 LIMITATION TO STUDY

The last MDA took place six months before the study. There is possibility of information (recall) bias.

CHAPTER FOUR

RESULTS

4.1 BIOMETRIC DATA OF RESPONDENTS

Table 1: Socio-demographic data

Variable	Frequency	Percent (%)
Ward		
Bokkos Central	104	25.0
Butura	104	25.0
Kamwai	104	25.0
Toff	104	25.0
Total	**416**	**100**
Age		
15-19	38	9.1
20-24	50	12.0
25-29	74	17.8
30-34	61	14.7
35-39	49	11.8
40-44	37	8.9
45-49	50	12.0
50+	57	13.7
Total	**416**	**100**
Sex		
Male	243	58.4
Female	173	41.6
Total	**416**	**100**
Ethnic group		
Kulere	207	49.8
Ron	134	32.2
Others	34	8.2
Hausa	24	5.8
Fulani	17	4.1
Total	416	100
Religion		
Christianity	351	84.4
Islam	51	12.3
Traditionalist	14	3.4
Total	**416**	**100**
Occupation		
Farmers	155	37.3
Trader	76	18.3
Teacher	52	12.5
Tailor	33	7.9
Unemployed	27	6.5
Others	73	17.5
Total	**416**	**100**
Educational Qualification		
None	89	21.4
Adult Education	45	10.8
Primary School	41	9.9
Secondary School	131	31.5
Tertiary	109	26.2
Others (non-response)	1	0.2
Total	**416**	**100**

One hundred and four respondents were sampled from each of the wards, making a total of four hundred and sixteen (416) respondents. 9.1% of the respondents were aged 15-19 years, 12.0% were aged 20-24 years, 17.8% were aged 25-29 years, 14.7% were aged 30-34, 11.8% were aged 35-39 years, 8-9% were aged 40-44 years, 12.0% were aged 45-49 years, and 13.7% were aged 50years and above.

More than half of the respondents 243(58.4%) were males while 173(41.6%) were females. 32.2% of the respondents were Ron tribe while 49.8% were of the Kulere ethnic group. 4.1% were Fulani, 5.8% were Hausa, 8.2% of the respondents were other ethnic groups like Mwaghavul, Mushere, Berom, Ngas, Ibo etc. 84.4% of the respondents were Christians, 12.3% of the Islamic Faith while 3.4% were traditionalists.

The occupation of the respondents were as follows: farmers 37.3%, traders 18.3%, teachers 12.5%, tailors 7.9%, unemployed 6.5% and others 17.5%. Educational qualification of the respondents were as follows: None 21.4%, adult education 10.8%, primary school 9.9%, secondary school 31.5%, tertiary 26.2%, other (non response) 0.2%.

Table 2: Showing the marital status of the respondents

Marital status	Frequency	Percent (%)
Single	139	33.4
Married	217	52.2
Separated	16	3.8
Divorced	13	3.1
Widowed	31	7.5
Total	**416**	**100.0**

Less than thirty five percent (33.4%) of the respondents were single, 52.2% were married, 3.8% separated, 3.1% divorced and 7.5% widowed.

Table 3: Showing the period of living in this village

Period of living	Frequency	Percent (%)
<1 year	31	7.5
1-<2years	13	3.1
2-4years	65	15.6
5+years	305	73.3
No response	2	0.5
Total	**416**	**100.0**

The respondents were asked how long they have lived in their respective villages: 7.5% greater than six months but less than a year. 3.1% have resided in the village they were interviewed between 1year to less than 2 years, 15.6% two to four years while 73.3% had resided for five years and above in their village.

4.2 KNOWLEDGE OF LYMPHATIC FILARIASIS

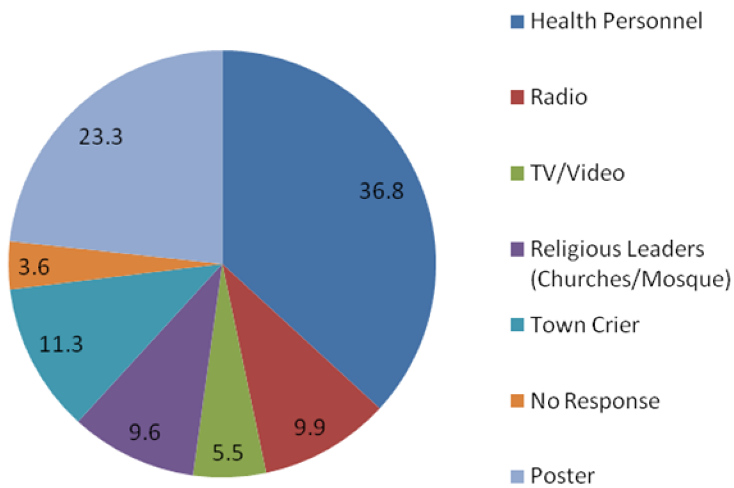


Figure 1: Source of information on lymphatic filariasis

The respondents' source of information on lymphatic filariasis were as follows: Health personnel 36.8%, radio 9.9%, television/video 5.5%, religious leaders (church/mosque) 9.6%, town crier 11.3%, poster 23.3%, no response to the question 3.6%.

Table 4: Showing the diagnosis of the disease of the respondents

Diagnosis of the disease	Frequency	Percent (%)
Physical examination by a doctor or a health worker	184	44.2
Blood examination	118	28.4
Don't know	113	27.2
No response	1	0.2
Total	**416**	**100.0**

Almost half of the respondents (44.2%) believe the disease can be diagnosed by physical examination by a doctor or a health worker, 28.4% thought it can be diagnosed through blood examination while 27.2% do not know how the disease is diagnosed. 0.2% did not respond to the question.

Table 5: Showing the Availability of treatment for elephantiasis (Leg swelling) of the respondents

Leg swelling	Frequency	Percent (%)
Yes	383	92.1
No	33	7.9
Total	**416**	**100.0**

Most of the respondents (92.1%) believed that there is treatment for elephantiasis (leg swelling) while 7.9% thought there was no treatment.

Table 6: Showing the Treatment for Leg swelling (elephantiasis) of the respondents

Treatment for leg swelling	Frequency	Percent (%)
Drugs (tablets)	319	83.3
Herbs	55	14.4
Prayers	9	2.3
Total	**383**	**100.0**

Of those who said there is treatment for elephantiasis, 83.3% believe it can be treated by drugs (tablets), 14.4% believe it can be treated by herbs, while 2.3% believe the treatment is prayers.

Table 7: Showing the availability of treatment for hydrocele (scrotal swelling) of the respondents

Availability of treatment for scrotal swelling	Frequency	Percent (%)
Yes	385	92.5
No	31	7.5
Total	**416**	**100.0**

Most of the respondents (92.5%) believed that there is treatment for hydrocele (scrotal swelling) while 7.5% believed that there is no treatment.

Table 8: Showing the treatment for hydrocele of the respondents

Treatment for hydrocele	Frequency	Percent (%)
Drugs	105	27.3
Surgery	255	66.2
Don't know	7	1.8
Other	12	3.1
No response	6	1.6
Total	**385**	**100.0**

Of the number that believed there is treatment for hydrocele 27.3% thought this can be done with drugs. 66.2% believe the treatment is through surgery, 1.8% don't know the treatment, 3.1% believed in other treatments like prayers and herbs.

Table 9: Showing the respondents response to prevention of lymphatic filariasis

Prevention of lymphatic filariasis	Frequency	Percent (%)
Yes	371	89.2
No	45	10.8
Total	416	100.0

Majority of the respondents (89.2%) believed that lymphatic filariasis can be prevented while 10.8% thought the disease cannot be prevented.

Table 10: Showing the respondents ways of preventing Lymphatic filariasis

Ways of preventing Lymphatic filariasis	Frequency	Percent (%)
Drug (Mass administration)	212	57.1
Insecticide treated nets	17	4.6
Cleaning of surroundings	33	8.9
Insecticide	2	0.5
All of the above	106	28.6
No response	1	0.3
Total	**371**	**100.0**

Of those that believed that the disease can be prevented 57.1% thought this can be done through mass drug administration, 4.6% thought insecticide treated bed nets, 8.9% felt this can be achieved through cleaning of surroundings,0.5% through the use of insecticides, 28.6% felt the disease can be prevented by all of the above measures while 0.3% did not respond.

4.3 ATTITUDE TO LYMPHATIC FILARIASIS

Table 11: Showing the respondents' possibility of acquiring (becoming infected with) lymphatic filariasis

Possibility of acquiring lymphatic filariasis	Frequency	Percent (%)
Yes	201	48.3
No	213	51.2
No response	2	0.5
Total	**416**	**100.0**

Almost of the half of the respondents (48.3%) though they can be infected with lymphatic filariasis while 51.2% felt that they were not at risk of being infected with lymphatic filariasis. 0.5% did not respond.

Table 12: Showing the response of eating, living or working with lymphatic filariasis patient by the respondents

Eating, living or working with lymphatic filariasis patient	Frequency	Percent (%)
Yes	354	85.1
No	58	13.9
No response	4	1.0
Total	**416**	**100.0**

Majority of the respondents (85.1%) said they can eat, live or work with lymphatic filariasis patients while 13.9% said they cannot. 1.0% did not respond.

Table 13: Showing the response of the respondents that lymphatic filariasis patients can be as productive as non-infected individuals

Lymphatic filariasis patients can be as productive as non-infected individuals	Frequency	Percent (%)
Yes	251	60.3
No	157	37.7
No response	8	1.9
Total	**416**	**100.0**

Majority of the respondents (60.3%) thought that lymphatic filariasis patients can be as productive as non-infected individuals, 37.7% said they are not as productive. 1.9% did not respond.

Table 14: Showing the respondents response that lymphatic filariasis patients deserve love, care and support

Lymphatic filariasis patients deserve love, care and support	Frequency	Percent (%)
Yes	392	94.2
No	21	5.0
No response	3	0.7
Total	**416**	**100.0**

An overwhelming majority of the respondents (94.2%) said lymphatic filariasis patients deserve love, care and support, 5.0% said they do not deserve it while 0.7% did not respond.

Table 15: Showing the respondents response to willingness to marry someone with hydrocele or elephantiasis

Willingness to marry someone with hydrocele or elephantiasis	Frequency	Percent (%)
Yes	120	28.8
No	295	70.9
No response	1	0.2
Total	**416**	**100.0**

Less than thirty percent (28.8%) of the respondents said they can marry someone with hydrocele or elephantiasis while 70.9% said they cannot while 0.2% did not respond.

Table 16: Showing the respondents response to infectiousness of lymphatic filariasis

Infectiousness of lymphatic filariasis	**Frequency**	**Percent (%)**
Yes	207	49.8
No	146	35.1
No response	63	15.1
Total	**416**	**100.0**

Almost half of the respondents (49.8%) thought that lymphatic filariasis is infectious while 35.1% said it is not infections while 15.1% did not respond saying they do not know the answer.

4.4 PRACTICES TOWARDS LYMPHATIC FILARIASIS

Table 17: Showing the respondents response to awareness of mass drug administration (MDA)

Awareness of mass drug administration (MDA)	**Frequency**	**Percent (%)**
Yes	360	86.5
No	56	13.5
Total	416	100.0

Majority of the respondents (86.5%) are aware of mass drug administration while 13.5% are not.

Table 18: Showing the respondents' response that they received drugs distributed during mass drug administration (MDA)

Received drugs distributed during MDA	Frequency	Percent (%)
Yes	343	82.4
No	73	17.6
Total	**416**	**100.0**

Majority (82.6%) of the respondents have received drugs distributed during MDA while 17.6% have not.

Table 19: Showing the respondents place of receipt of the drugs

If yes, place of receipt of the drugs	Frequency	Percent (%)
Fixed point	45	13.1
House to house distribution	298	86.9
Total	**343**	**100.0**

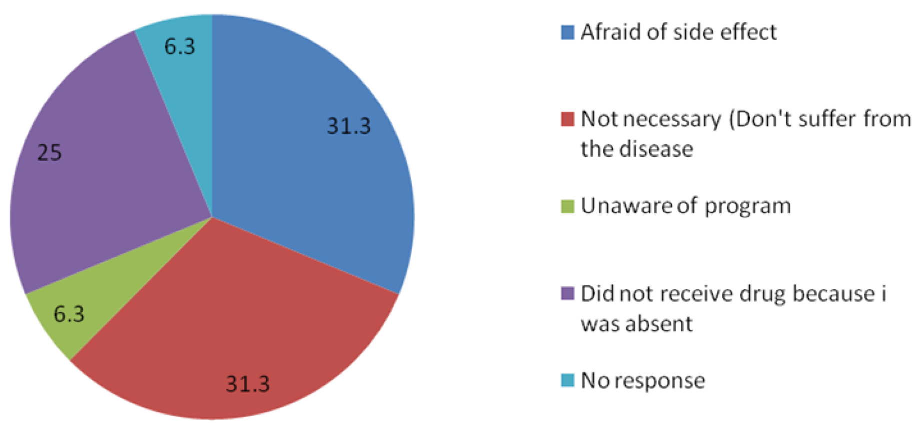
Majority (86.9%) of the respondents received the drugs during house to house distribution while only 13.1% received it from a fixed point like the PHC Clinic.

Table 20: Showing the response of those swallowing/ consuming collected mass drug administration (MDA) drugs

Those swallowing/ consuming collected MDA drugs	Frequency	Percent (%)
Yes	326	95.0
No	17	4.7
Total	**343**	**100.0**

Majority of the respondents (95%) of the respondents consumed or swallowed the drugs, 4.7% did not swallow the drugs while 0.3% did not respond to the question.

Figure 2: Showing the reasons for non-compliance



Reasons for non-compliance

Of those that did not consume the drugs, various reasons were given: 31.1% said they were afraid of side effects while another 31.3% said their reason was that they thought it was not necessary since they don't suffer from the disease 25.0% did not receive drugs because they were absent at the time of drug distribution. 6.3% were unaware of the program. 6.3% did not respond to the question.

Table 21: Showing the respondents that received insecticide treated bed nets

Received insecticide treated bed nets	Frequency	Percent (%)
Yes	113	27.2
No	303	72.8
Total	**416**	**100.0**

Only 27.2% have received insecticide treated bed nets, majority 72.8% have not received Insecticide Treated Nets distributed during the programme.

Table 22: Showing the respondents that slept under a net the previous night

Slept under a net the previous night	Frequency	Percent (%)
Yes	105	25.2
No	311	74.8
Total	**416**	**100.0**

Majority of the respondents (74.8%) did not sleep under a net the previous night while only 25.2% slept under an ITN the previous night.

Table 23: Showing the respondents that sleep under a net daily

Do you sleep under a net daily	**Frequency**	**Percent (%)**
Yes	67	16.1
No	349	83.9
Total	**416**	**100.0**

Only 16.1% sleep under an ITN daily with majority 83.9% stating that they do not sleep under an ITN daily.

Table 24: Showing the respondents that believe that they have lymphatic filariasis

Belief that they have lymphatic filariasis	**Frequency**	**Percent (%)**
Yes	81	19.5
No	335	80.5
Total	**416**	**100.0**

Less than twenty percent (19.5%) believe that they have lymphatic filariasis while 80.5% said they do not have the disease.

Table 25: Showing the respondents place of diagnosis

Place of diagnosis	Frequency	Percent (%)
In a clinic/hospital	46	56.8
At home by village health worker	27	33.3
In Herbal/traditional home	7	8.6
No response	1	1.2
Total	**81**	**100.0**

More than half of the respondents (56.8%) said they were diagnosed in a clinic/hospital, 33.3% at home by a village health worker, 8.6% in herbal/traditional home and 1.2% did not respond to the question.

Table 26: Showing the respondents that went for care

Those who went for care	Frequency	Percent (%)
Yes	67	82.7
No	5	6.2
No response	9	11.1
Total	**81**	**100.0**

Majority of the respondents (82.7%) did seek for care, 6.2% did not seek for care while 11.1% did not respond to the question.

Table 27: Showing the respondents place of help

If yes, place of help	Frequency	Percent (%)
Clinic/hospital	43	64.2
Chemist	3	4.5
Herbalist	9	13.4
Other	9	13.4
Total	64	95.5
No response	3	4.5
Total	**67**	**100.0**

Of those who did seek for care, 64.2% did so in a clinic/hospital, 4.5% in a chemist and 13.4% from herbalist, while 13.4% did seek for care from other sources like prayers and friends.

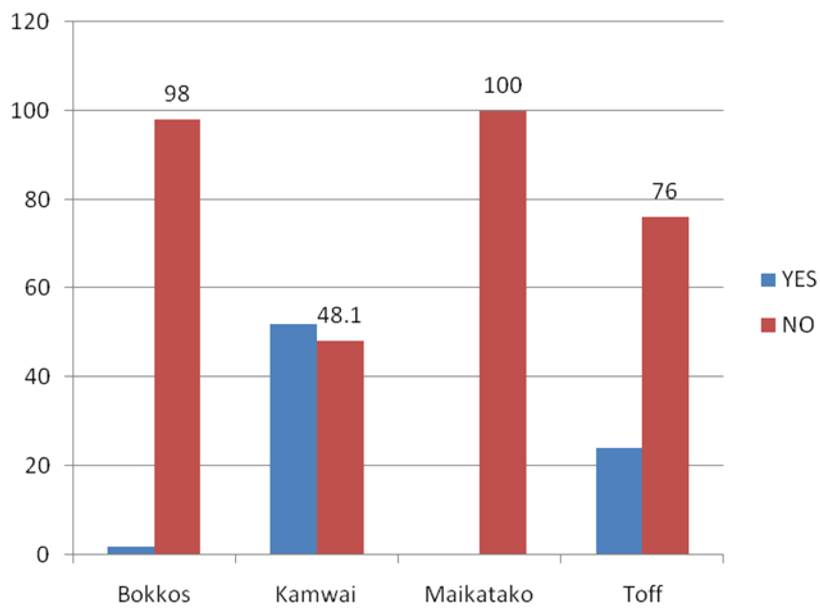


Figure 3: Showing the presence of LF disease in the various wards

The above chart is a relationship between ward and presence of lymphatic filariasis 1.9% of people in Bokkos Central said they think they have lymphatic filariasis, Butura ward 0%, Kamwai 51.9% and Toff 24.0% of respondents thought they have lymphatic filariasis. There was a statistically significant relationship between the ward of residence and the presence of lymphatic filariasis disease with Pearson Chi-square X^2 = 116.805, at degree of freedom 3, P is 0.00.

Table 28: Showing the respondents age categorized and having lymphatic filariasis

		Do you have lymphatic filariasis		Total
		Yes	No	
Age categorized	15-19	4	34	38
		10.5%	89.5%	100.0%
	20-24	4	46	50
		8.0%	92.0%	100.0%
	25-29	10	64	74
		13.5%	86.5%	100.0%
	30-34	8	53	61
		13.1%	86.9%	100.0%
	35-39	13	36	49
		26.5%	73.5%	100.0%
	40-44	4	33	37
		10.8%	89.2%	100.0%
	45-49	20	30	50
		40.0%	60.0%	100.0%
	50+	18	39	57
		31.6%	68.4%	100.0%
Total		**81**	**335**	**416**
		19.5%	**80.5%**	**100.0%**

This is a table showing the relationship between the presence of lymphatic filariasis and age. The disease is more prevalent in the 45-49 years age group (40.0%), 31.6% of the cases was found in the 50+ years old group. The disease is least prevalent in the 20-24 years old group (8.0%) and 15-19 years old group (10.5%).

There was a statistically significant relationship between age and the presence of lymphatic filariasis disease (Pearsons chi square x^2 31.477, at degree of freedom = 7 and P=293).

Table 29: Showing the respondents' age categorized and knowledge that mosquitoes transmit lymphatic filariasis

		Transmission of filariasis (Mosquitoes)		
		True	**False**	**Total**
Age categorized	15-19	11	26	37
		29.7%	70.3%	100.0%
	20-24	25	24	49
		51.0%	49.0%	100.0%
	25-29	40	33	73
		54.8%	45.2%	100.0%
	30-34	32	24	56
		57.1%	42.9%	100.0%
	35-39	23	24	47
		48.9%	51.1%	100.0%
	40-44	21	15	36
		58.3%	41.7%	100.0%
	45-49	31	17	48
		64.6%	35.4%	100.0%
	50+	33	23	56
		58.9%	41.1%	100.0%
Total		**216**	**186**	**402**
		53.7%	**46.3%**	**100.0%**

Relationship between age and knowledge that mosquitoes transmit lymphatic filariasis

The table shows that 29.7% of respondents aged 15-19 years identified mosquitoes in the transmission of LF, 51% of 20-24 years age group, 54.8% of 25-29 years group, 57.1% of 30-34 years age group, 48.9% of 35-39 years group, 58.3% of the 40-44 years group,64.6 %of the 45-49years age group and 58.9 % of the 50 years and above age group identified mosquitoes in the transmission of LF.

There was no statistically significant relationship between age and the knowledge that mosquitoes transmit lymphatic filariasis (Pearsons chi square $x^2 = 12.135$, df = 7, and p = > 0.05).

Table 30: Showing the respondents' occupation and knowledge that mosquitoes transmit lymphatic filariasis

		Transmission of filariasis (Mosquitoes)		
		True	**False**	**Total**
Occupation	Farmer	87	61	148
		58.8%	41.2%	100.0%
	Trader	34	41	75
		45.3%	54.7%	100.0%
	Teacher	29	20	49
		59.2%	40.8%	100.0%
	Tailor	13	19	32
		40.6%	59.4%	100.0%
	Unemployed	13	14	27
		48.1%	51.9%	100.0%
	Other	40	31	71
		56.3%	43.7%	100.0%
Total		**216**	**186**	**402**
		53.7%	**46.3%**	**100.0%**

The table shows the relationship between occupation and the knowledge that mosquitoes transmit lymphatic filariasis 58.8% of farmers identified mosquitoes in the transmission of lymphatic filariasis, 45.3% of the traders, 59.2% of teachers, 40.6% of tailors, 48.1% of unemployed also identified mosquitoes as causing lymphatic filariasis.

There was no statistically significant relationship between occupation and the knowledge that mosquitoes transmit lymphatic filariasis (Pearson chi-square 6.977, df 5, P = > 0.05)

Table 31: Educational qualification and awareness of mass drug administration (MDA)

		Are you aware of mass drug administration (MDA)		
		Yes	**No**	**Total**
Educational qualification	None	76	13	89
		85.4%	14.6%	100.0%
	Adult education	39	6	45
		86.7%	13.3%	100.0%
	Primary school (Completed)	23	2	25
		92.0%	8.0%	100.0%
	Primary school (Uncompleted)	13	3	16
		81.3%	18.8%	100.0%
	Secondary school (Completed)	66	8	74
		89.2%	10.8%	100.0%
	Secondary school (Uncompleted)	52	5	57
		91.2%	8.8%	100.0%
	Tertiary (Completed)	80	11	91
		87.9%	12.1%	100.0%
	Tertiary (Uncompleted)	10	8	18
		55.6%	44.4%	100.0%
	Other	1	0	1
		100.0%	0.0%	100.0%
Total		**360**	**56**	**416**
		86.5%	**13.5%**	**100.0%**

The relationship between educational qualification and awareness of MDA. 85.4% of those with no education are aware of MDA, 92.0% of primary school (completed), 89.2% of secondary school (completed) 87.9% of those with tertiary education are aware of MDA.

There was no statistically significant relationship between education and the awareness of MDA (Pearson chi-square x^2 = 17.783,at degree of freedom 8, P = 0.589).

Table 32: Educational qualification and consuming or swallowing the MDA drugs

		Did you consume or swallow the drugs		
		Yes	**No**	**Total**
Educational qualification	None	61	5	66
		92.4%	7.6%	100.0%
	Adult education	37	2	39
		94.9%	5.1%	100.0%
	Primary school (Completed)	19	3	22
		86.4%	13.6%	100.0%
	Primary school (Uncompleted)	13	0	13
		100.0%	0.0%	100.0%
	Secondary school (Completed)	62	3	65
		95.4%	4.6%	100.0%
	Secondary school (Uncompleted)	48	0	48
		100.0%	0.0%	100.0%
	Tertiary (Completed)	75	3	78
		96.2%	3.8%	100.0%
	Tertiary (Uncompleted)	10	0	10
		100.0%	0.0%	100.0%
	Other	1	0	1
		100.0%	0.0%	100.0%
Total		**326**	**16**	**342**
		95.3%	**4.7%**	**100.0%**

The table shows the relationship between swallowing drugs distributed during MDA and educational qualification of the respondents. 92.4% of those with no education swallowed the drugs, 86.4% of those who completed primary school, 95.4% of those who completed secondary school, 96.2% of those who completed tertiary education swallowed their drugs

There was no statistically significant relationship between education qualification and the consumption of drugs distributed during MDA (Person chi-square 8.874, at degree of freedom 8, P = 0.068).

Table 33: Educational qualification and sleeping under a net daily

		Do you sleep under a net daily		
		Yes	**No**	**Total**
Educational qualification	None	6	83	89
		6.7%	93.3%	100.0%
	Adult education	9	36	45
		20.0%	80.0%	100.0%
	Primary school (Completed)	2	23	25
		8.0%	92.0%	100.0%
	Primary school (Uncompleted)	4	12	16
		25.0%	75.0%	100.0%
	Secondary school (Completed)	15	59	74
		20.3%	79.7%	100.0%
	Secondary school (Uncompleted)	6	51	57
		10.5%	89.5%	100.0%
	Tertiary (Completed)	24	67	91
		26.4%	73.6%	100.0%
	Tertiary (Uncompleted)	1	17	18
		5.6%	94.4%	100.0%
	Other	0	1	1
		0.0%	100.0%	100.0%
Total		**67**	**349**	**416**
		16.1%	**83.9%**	**100.0%**

The table shows that 6.7% of those with no formal education sleep under a net daily, 20.0% of those with adult education, 8.0% of those that completed primary school, 20.3% of secondary school (completed) and 26.4% of those who completed tertiary school sleep under a net daily.

There was a statistically significant relationship between educational qualification and sleeping under a net daily. (Pearsons Chi-square =19.472, at degree of freedom = 8, p = 0.013).

4.5 FOCUS GROUP DISCUSSIONS

I investigated the residents of Bokkos LGA in four wards: Toff, Kamwai, Butura (Maikatako village) and Bokkos Central to determine their knowledge, attitudes and practices towards LF. Eight focused group discussions were held between 9th May 2010 and20th June 2010. The groups were homogenous.

Results: Six out of the eight groups spontaneously mentioned scrotal swelling and leg swelling, the most common manifestations of lymphatic filariasis, as important health problems in their communities. The groups had a good knowledge of the symptoms of lymphatic filariasis. They mentioned leg swelling, scrotal swelling, fever, genital swelling, body itching and rashes as common symptoms. The groups said that in Kulere language leg swelling is “mu wom siau” while scrotal swelling is called “mu wom njwal”. In Ron dialect scrotal swelling is called “motan ti shishwal ma fosan” while leg swelling is called “motan ti sakwa ma fosan”.

Five out of the eight groups confirmed that the disease is common in their communities, with some of the discussants stating that they have the disease. Five of the groups identified mosquitoes as the cause of lymphatic filariasis. One group agreed that walking barefooted on pigs’ faeces and sexual contacts cause LF. Another group stated that the disease is caused by excessive sexuality, witchcraft and kissing. The last group said it was due to poor personal hygiene, dirty environment and extreme heat. However, most of the groups agreed that the disease can be prevented by vector control measures, swallowing MDA drugs and use of ITNs. One group however stated that keeping pigs in clean environment so that people do not step on their faeces plus MDA drugs and vector control measures prevent LF. Another group was of the opinion that LF is prevented by avoiding sex, drinking good water and vaccination.

All the groups agreed that that if they have leg or scrotal swelling they would go to see a doctor in a hospital but some discussants preferred seeing herbalist or friend for leg swelling. They also stated that lymphatic filariasis patients deserve love and care and should be supported. Most of the groups agreed that Government or an organization is helping them with mosquito nets and MDA drugs. Two of the groups however stated that Government is not helping them. All the groups agreed that ITNs prevent mosquitoes and lymphatic filariasis. Except 60% of one group that stated that ITNs prevent mosquitoes but not lymphatic filariasis.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 DISCUSSION

The survey which was a descriptive cross-sectional study to assess the knowledge, attitudes and practices of residents of Bokkos LGA towards lymphatic filariasis (LF) had four hundred and sixteen (416) respondents. One hundred and four (104) respondents were sampled from each of the wards of Bokkos Central, Butura, Kamwai and Toff wards as seen in table 1.

The respondents had a mean age of 36.3 years, were of the various ethnic groups like Kulere, Ron, Fulani, Hausa, and other ethnic groups like Mushere, Ibo, Angas, Mwaghavul. Majority of the respondents were Christians, the rest were of the Islamic faith and traditionalists. This shows that despite the crisis in the state, the various ethnic groups and people of different religions are living in peace in the LGA.

The majority of the respondents were farmers, others were traders, teachers, tailors, and unemployed. Most of the respondents were literate and had attended a minimum of secondary school. Majority of the respondents had resided for five years and above in the village they were interviewed.

The respondents' major source of information on lymphatic filariasis and mass drug administration (MDA) were from health personnel and posters. Town Criers, radio, religious leaders (church/Mosque) and television/Video accounted for the other sources of information. The findings contradicted that of Aswarthy S. and colleagues in a study in a rural community in Kerala, India where most (62.3%) of his respondents, obtained information from television or radio programmes.[63]

The respondents were knowledgeable about the presence of leg swelling and scrotal swelling as the symptoms of lymphatic filariasis. This finding was consistent with that of Hopkins and colleagues in a study in Pankshin and Akwanga LGAs in Plateau and Nasarawa states respectively where he reported that community members were generally aware of the manifestation of lymphatic filariasis as hydrocele and leg swelling.[75] This contradicted the findings of Eberhard and colleagues in a study in Haiti in which all the people knew of the clinical conditions of hydrocele and elephantiasis.[60]

Majority of the respondents believed that lymphatic filariasis is transmitted by Mosquitoes. Others gave other causes: hereditary, extreme sexuality, hard work/trauma, exposure to extreme heat while some believe it was caused by witches and wizards. The finding is similar to that of Sherchand and colleagues who reported from a study in Nepal that 49.3% of respondents said that mosquitoes cause lymphatic filariasis.[61] This however contradicted the findings of Hopkins, Ramaiah, Rath and Msyamboza and their colleagues who reported a low to absent knowledge on the cause of lymphatic filariasis by mosquitoes.[59,62,67,75]

There was no statistically significant relationship between the knowledge that mosquitoes transmit lymphatic filariasis and Sex, Occupation, age, and educational qualification. This contradicted the report from Philippines by Wynd and colleagues in which correct knowledge of disease transmission was associated with the highest level of formal educational attainment.[58]

Only few of the respondents knew that lymphatic filariasis is diagnosed through blood examination. Most thought it is by physical examination while the rest didn't know how it is diagnosed. Majority believe there is treatment for elephantiasis and hydrocele.
Of those who said there is treatment for elephantiasis, majority believes it can be treated by drugs (tablets), others believe it can be treated by herbs or prayers. Majority of those who believe there is treatment for hydrocele believes it is through surgery, others thought it can be done with drugs, few do not know the treatment while others believed in other treatment like prayers and herbs. The figures are similar to that of Eberhard and colleagues in a survey conducted in Haiti.[60]

Majority of the respondents knew that lymphatic filariasis can be prevented. They believed this can be achieved through mass drug administration and vector control measures. This contradicted the write-up of Wynd and colleagues that endemic communities do not know the importance of minimizing mosquito contact for preventing infection.[58]

In the respondents' attitude to lymphatic filariasis about half of them felt that they were not at risk of (or vulnerable) to being infected with it. (refer table 16). This supported the findings of Ogbonnaya and colleagues from a survey in Lau Local Government Area of Taraba State, Nigeria where a low perception of personal susceptibility to lymphatic filariasis was identified among the people.[71] Most said they can eat, live or work with lymphatic filariasis patients (as seen in table 12) and an overwhelming majority of them said the patients deserve love, care and support (as seen in table 13). However, majority of them said they cannot marry someone with hydrocele or elephantiasis (table 15) and about half of them believed that the disease is infectious (as seen in tables 16). This finding corroborated the write-up of Wynd and colleagues who reported in some studies that women and men with lymphatic filariasis disease are considered to have limited marriage prospects.[58] There was no statistically significant relationship between the attitude to lymphatic filariasis (eating, living or working with lymphatic filariasis patient) and age, gender and educational qualification.

Majority of the respondents were aware of mass drug administration and have received drugs distributed during MDA. Most of those that received drugs did so during house to house distribution while only few received drugs from a fixed point like the PHC clinic. Almost all those who received the drugs consumed them while few did not swallow the drugs. The findings contradicts that of Padhy and colleagues in a study in Gudiapokhari, Puri district of India where of 170 respondents only 160 or 93.9% had received the drugs distributed during MDA but only 106 or 66.25% consumed them and 54 or 33.7% did not consume.[65] The findings also contradicts the report from Kenya by Wamme and colleagues who had low treatment coverage of 46.5% and 88%.[69] Mukhopadiyay and colleagues also reported low treatment coverage of 64.64% from Andra Pradesh, India.[66] There was no statistically significant relationship between the awareness of mass drug administration and age, gender and educational qualification. Similarly there was no statistically significant relationship between the consumption of MDA drugs and age, gender and educational qualification.

Of those who swallowed the drugs, majority did so after eating while only the minority on empty stomach. Most of them experienced no side effect after taking the drugs while the rest experienced minor side effects like vomiting, fever, drowsiness and swelling/Oedema). Of those who did not consume the drugs various reasons were given: Some were afraid of side effects, others thought it was not necessary since they do not suffer from the disease, a quarter of them do not receive drugs because they were absent at time of distribution and others were unaware of the mass drug administration program. The findings were similar to that of Aswathy in a study in a rural community in Kerala, India in which of those who did not ingest the MDA drugs. 39.4% said they were fearful of the drugs and 12.5% had misconceptions about the aims of MDA. However most of the (66.3%) considered MDA to be useful.[63] The findings contradicts that of Padhy and colleagues from Puri district, India in which reasons for non-consumption among 54 respondents were: 62.9% were afraid of side effects and 25.9% felt the drugs to be unnecessary as they themselves do not suffer from lymphatic filariasis diseases, 11.0% were unaware of program.[65]

Majority of the respondents believed that mass drug administration (MDA) is useful in combating the disease with majority willing to participate in future MDA. Most of the respondents believed the prevalence of lymphatic filariasis has reduced in their communities since the commencement of MDA while few said the prevalence has not reduced.

Only about one third of the respondents have received insecticide treated nets (ITNs) distributed during the programme (as seen in table 21). Only a quarter of them slept under a net the previous night (as seen in table 22) and only 16.1% sleep under an ITN daily (as seen in table 23). This finding is similar to that of Wagbatsoma and Onwujekwe and colleagues in their studies, in Etsako West LGA, Edo State, Nigeria and Enugu State, South-Eastern Nigeria respectively, where there was low ownership and utilization of ITNs.[72,73]

Mukhopadhyay and colleagues also reported low Mosquito nets (ownership and utilization) from their study in Andra Pradesh, India where of 7168 respondents only 1204 (16.79%) had mosquito nets in their homes but only 9.02% use mosquito nets daily.[66] The study however contradicts that of Animat and colleagues in a study in Ethiopia in which majority of the respondents (85.7%) used nets daily and history of sleeping under ITNs the previous night was 81.6%.[68]

There was a statistically significant relationship between educational qualification and sleeping under a bed net daily but no statistically significant relationship between sleeping daily under an ITN and gender. Similarly there was no statistically significant relationship between sleeping under ITNs and knowledge that mosquitoes transmit lymphatic filariasis.

Of the 416 respondents, 81 believed that they are suffering from lymphatic filariasis. Of this number 38 said they have scrotal swelling while 32 said they have leg swelling. Other manifestation of the disease included genital swelling, breast swelling and skin hardening/thickening. Majority of the respondents who believed they have the disease said they were diagnosed in a clinic/hospital, others were diagnosed at home by village health worker or in herbal/traditional medicine home. Only 43 out of 81 did seek for help for their condition. Majority went to a clinic/hospital to seek for help, others went to a chemist, a herbalist /traditional medicine practitioner, prayer houses and friends for help.

There is a statistically significant relationship between ward of residence and presence of disease. Toff and Kamwai wards have most of the cases. This can be explained by their topography, abundance of mining ponds, vegetation and rivers and their proximity to another endemic LGA, Wamba in Nasarawa State. There is also a statistically significant relationship between the presence of disease and age. The disease is most common in the 45-49 years age group and least common in the 20-24 years age group.. There is no statistically significant relationship between gender and period of stay in residence and the presence of lymphatic filariasis disease. These findings were similar to that of Hopkins and colleagues from their studies in Pankshin LGA and Akwanga LGAs in Plateau and Nasarawa States respectively, in which affected persons themselves sought both traditional and modern remedies. Sherchand and collegues in a study in Nepal reported the treatment seeking behaviour of lymphatic filariasis patients in which only 38% went to modern medicine practitioners, 30% consulted traditional healer, 22% used herbal medicine for self treatment and 10% did not seek treatment.[61,70] This finding however contradicts that of Omude and colleagues who revealed preference of traditional medicine over modern medicine by lymphatic filariasis disease patients from a study in Benue state, Nigeria.[74]

5.2 CONCLUSIONS

The study has shown that most of the residents are knowledgeable about lymphatic filariasis. More than half of the respondents knew that mosquitoes transmit the disease and majority of them know the clinical presentation, prevention and treatment of the disease. Information about lymphatic filariasis and MDA was received mainly from health personnel. There was a high treatment coverage (82.45%) mostly achieved through house to house distribution and a 95% compliance. However, there was a low ownership and utilization of insecticide treated bed nets.

5.3 RECOMMENDATIONS

1. Awareness of the cause of the disease, the relationship between infection and disease, the importance of daily usage of mosquito nets, and goals of the MDA Programme must be heightened through community based education campaigns to increase the possibility of acceptance and sustain the high compliance.
2. People can be helped to take personal protection measures and seek appropriate treatment by health education campaigns that emphasize at highlighting the role of mosquitoes in disease transmission, consequences of infection and means of prevention.
3. Most of the communities are rural and difficult to reach and therefore the need to improve access to the use of bed nets must be achieved to reduce lymphatic filariasis transmission.
4. As there are further rounds of MDA, information to address the reasons for non-compliance including the fear of side effects of MDA drugs, spread by false rumour must be addressed. The results of KAPS surveys should be used to prepare a health promotion campaign for future MDA.
5. The house distribution of MDA drugs has to be strengthened. This can be achieved through community engagement and effective utilization of existing social structures and communication networks. Distributors should follow local religious services when community members are gathered together. Village health

workers, teachers, religious leaders, traditional leaders and opinion leaders should be involved.

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APPENDICES

APPENDIX I

QUESTIONNAIRES

SOCIODEMOGRAHIC DATA

WARD -----------------------

1. Age_________ Years (as of last birthday)

2. Sex: Male [ ] Female [ ]

3. Marital Status: Single [ ] Married [ ] Separated [ ]

   Divorced [ ] Widowed [ ]

4. Ethnic group: Ron [ ] Kulere [ ] Fulani [ ] Hausa [ ]

   Others (specify: -------------------------------------

5. Religion: Christianity [ ] Islam [ ] Traditionalist [ ]

   Others (specify) ------------------------------------

6. Occupation Farmer [ ] Trader [ ] Teacher [ ] Tailor [ ] Unemployed

   [ ] Others (specify): ------------------------------------

7. Educational Qualification: None [ ] Adult Education [ ]

   Primary school: Completed [ ], Uncompleted [ ]; Secondary school:

   Completed [ ] Uncompleted [ ] Tertiary: Completed [ ] Uncompleted [ ],

   Others specify: ---------------------------

8. Residence: ---

9. How long have you lived in this village? $\leq$1 year [ ], 1-$\leq$2years [ ],

   2-4 years [ ], 5 and above years [ ]

A. Assessment of knowledge of lymphatic filariasis

1. Have you heard of lymphatic filariasis? (a) Yes [ ] (b) No [ ]

2. If yes, When did you hear about it?

(i) < 1 year ago [ ]

(ii) 2-4 years ago [ ]

(iii) >4-6 years ago [ ]

(iv) > 6 years ago [ ]

3. Source of information on lymphatic filariasis

a. health personnel [ ] b. Radio [ ] c. T.V. or Video [ ]

d. Religious leaders (Church / Mosque) [ ] e. Town crier [ ]

f. Poster [ ]

4. Which of these are symptoms of the disease?

i)	Fever	(a) Yes [ ]	(b) No [ ]
ii)	Swelling of limbs	(a) Yes [ ]	(b) No [ ]
iii)	Scrotal swelling	(a) Yes [ ]	(b) No [ ]
iv)	Lymph node swelling	(a) Yes [ ]	(b) No [ ]
v)	Lymph node pains	(a) Yes [ ]	(b) No [ ]
(vi)	Body itching	(a) Yes [ ]	(b) No [ ]
(vii)	Skin hardening or thickening	(a) Yes [ ]	(b) No [ ]

5. How is filariasis transmitted?

a.	Hereditary	True [ ]	False [ ]
b.	Excessive sexuality	True [ ]	False [ ]
c	Hardwork/ Trauma	True [ ]	False [ ]

d. Mosquitoes True [ ] False [ ]

e. Exposure to extreme heat True [ ] False [ ]

f. Witches & Wizards True [ ] False [ ]

6. How is the disease diagnosed?

a. Physical examination by a doctor or a health worker? [ ]

b. Blood examination [ ]

c. Don't know [ ]

7. Is there treatment for elephantiasis (leg swelling)? Yes [ ] No [ ]

8. If yes how is it treated?

(a) Drugs (tablets) [ ] (b) Herbs [ ] (c) Prayers [ ]

(d)others (specify) ----------------------

9. Is there treatment for hydrocele (scrotal swelling)

Yes [ ] No [ ]

10. If yes how (a) Drugs [ ] (b) Surgery [ ] (c) Don't know [ ]

(d) others (specify) -----------------

11. Can lymphatic filariasis be prevented? Yes [ ] No [ ]

12. If yes how? (a) Drugs (Mass drug administration) [ ]

(b) Insecticide treated nets [ ] (c). cleaning of surroundings [ ]

(d) Insecticide [ ] (e) All of above [ ]

13. How do you control or reduce mosquitoes? (a) . I don't know [ ]

(b). Keep surrounding clean [ ] (c) Proper drainage [ ]

(d) Spraying chemicals in water [ ] (e) Combination of 2-4 above [ ]

B. Assessment of Attitude towards Lymphatic filariasis

1. Do you think you can acquire (become infected with) lymphatic filariasis? (a)Yes [ ] (b) No [ ]

2. Can you eat, live or work with lymphatic filariasis patient?

   (a) Yes [ ] (b) No [ ]

3. Can lymphatic filariasis patients be as productive as non-infected individuals?

   (a) Yes [ ] (b) No [ ]

4. Do lymphatic filariasis patients deserve love, care and support?

   (a) Yes [ ] (b) No [ ]

5. Can you marry someone with hydrocele or elephantiasis?

   (a) Yes [ ] (b) No [ ]

6. Is lymphatic filariasis infectious? (a) Yes [ ] (b) No [ ]

C**. Assessment of Practices towards Lymphatic Filariasis**.

1. Are you aware of mass drug administration (MDA) ? (a) Yes [ ] (b) No [ ]

2. Have you received drugs distributed during MDA? (a) Yes [ ] (b) No [ ]

3. If yes, where did you receive the drugs? (a) Fixed point [ ]

   (b) House to house distribution [ ]

4. Did you consume or swallow the drugs? (a) Yes [ ] (b) No [ ]

5. If yes, was it (a) on empty stomach [ ] (b) After eating [ ]

6. If No, Reasons for non-consumption:

   a. Afraid of side effects [ ]
   b. Not necessary (don't suffer from disease) [ ]
   c. Unaware of program [ ]
   d. did not receive drugs because

(i) I was absent [ ]

(ii) No distributor [ ]

7. After taking the drugs which of the following side-effects did you experience

(a) Fever Yes [ ] No [ ]

(b) Drowsiness Yes [ ] No [ ]

(c) Swelling/ oedema Yes [ ] No [ ]

(d) Vomiting Yes [ ] No [ ]

(e) No side effect Yes [ ] No [ ]

8. Is mass drug administration useful in combating the disease?

(a) Yes [ ] (b) No[ ]

9. Are you willing to participate in future MDA? (a) Yes [ ] (b) No [ ]

10. Do you think that prevalence of lymphatic filariasis has reduced in your village since commencement of MDA (a) Yes [ ] (b) No [ ]

11. Have you received insecticide treated bed nets? (a) Yes [ ] (b) No [ ]

12. How many Insecticide treated bed nets do you have in your family/household?

(a) 1 [ ] (b) 2 [ ] (c) 3 [ ] (d) 4 [ ]

(e) 5 and above [ ] (f) None [ ]

13. How many people (average) sleep under a net in your household?

a. 1 [ ] b. 2 [ ] c. 3 [ ] d. 4[ ] e. None [ ]

14. Did you sleep under a net last night (a) Yes [ ] (b) No [ ]

15. Do you sleep under a net daily? (a) Yes [ ] (b) No [ ]

16. Do you have lymphatic filariasis? (a)Yes [ ] (b) No [ ]

If yes, answer questions 17-21

17. what manifestation of the disease do you have ?

(i) Scrotal swelling (hydrocele) [ ]

(ii) Genital swelling [ ]

(iii) Leg swelling [ ]

(iii) Breast swelling [ ]

(iv) Skin hardening/thickening [ ]

(v) Others (specify) --------

18. Where were you diagnosed?

(i) In a clinic/hospital [ ]

(ii) At home by village health worker [ ]

(iii) In Herbal/traditional home [ ]

(iv) Others (specify) ---------------------

19. When were you diagnosed with lymphatic filariasis?

(i) < 1 year ago [ ] (ii) 2-4 years ago [ ] (iii) > 4 years ago [ ]

20. Did you seek for care? (a) Yes [ ] (b) No [ ]

21. If yes, where did you seek help?

(i) Clinic/hospital [ ] (ii) chemist [ ] (iii) herbalist [ ]

(iv) Others (specify)----------------------

APPENDIX II

FORMAT FOR FOCUS GROUP DISCUSSIONS

1. What are the various diseases in your community that are of concern to you?
2. Some people in this community have talked to me about Filariasis, Could you tell me how you know someone has the disease?
3. In your own opinion, what do you think is the magnitude of this problem in your community?
4. What do you think are the causes of this disease condition?
5. In your own opinion, how do you think this disease can be prevented?
6. In your own opinion how do you think we should interact or relate with people with leg swelling or scrotal swelling?

7. If you have leg swelling or scrotal swelling, what would you do?
8. What are the efforts of Government or other Organizations with regard to this condition or disease?
9. What is your opinion about the use of Insecticide treated bed nets with regards to the prevention and management of this disease condition?

FOOTNOTE: After the discussion, the moderator should provide up-dated information about lymphatic Filariasis to the group.