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ACCEPTABILITY OF THE MASS DRUG ADMINISTRATION FOR LYMPHATIC FILARIASIS AMONG COMMUNITY MEMBERS IN BOLE DISTRICT, SAVANAH REGION, GHANA

BY

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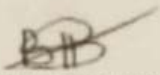
DECLARATION

I, Habibata Baldé, declare that apart from references to previous works that I have duly acknowledged, this report results from my own independent work conducted under the supervision of Dr. Emmanuel Asampong. I further declare that this report has never been submitted either partially or wholly to an academic institution for the award of a degree.



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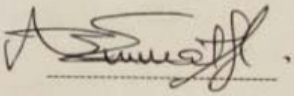

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20/ 11/ 2020

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DEDICATION

I dedicate this dissertation to my beloved and tender parents, my dear father Mamadou Saïdou Baldé and my charming mother, Mamadou Ramata Sow, for their unconditional love, tireless support, unwavering confidence, and constant prayers. I love you from the bottom of my heart.

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ABSTRACT

Introduction: The Global Program for the Elimination of Lymphatic Filariasis (LF) was launched in 2000 by the World Health Organization to eliminate the disease by 2020. This program's key objective is to interrupt the transmission of LF through Mass Drug Administration (MDA). However, despite the large-scale implementation of MDAs in endemic countries, the disease is still a public health problem in 49 countries worldwide. The objective of this study was to explore factors associated with the acceptability of MDA for LF among communities in the Bole District in 2020.

Methods: This was a qualitative study using phenomenology and narrative approach. IDIs and KIIs were conducted in Bole District with study participants selected using stratified purposive and critical case sampling techniques. Data were collected in the form of audio recording, transcribed into English, and analyzed using thematic analysis. Terms emerging from the data were coded and classified into sub-themes and themes using NVivo version12.

Results: The results showed that communities and drug distributors have poor knowledge of LF and MDAs, and this affects their perception of risk and decision to accept the drug or not. Belief in the effectiveness of the drugs through its preventive and curative effect was the positive perceptions of the MDAs. In contrast, skepticism about its purpose and the effectiveness of the drugs were unfavorable perceptions. Drug contraindications, low perception of risk, mistrust regarding the drug, inappropriate timing of distribution, side reactions, and ineffective communication were some of the barriers cited by participants. The main enabling factors found were health education on LF and MDA awareness, community involvement, readjustment of the distribution schedule, and improving distributor motivation.

Conclusion: There is the need for more health education on LF and MDA to enhance community involvement and ensure the program's better acceptability.

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LIST OF ABBREVIATIONS

ADL	Adenolymphagitis
CDDs	Community Drug Distributors
CHIPS	Community-Based Health Planning and Services
CM	Community Member
CMDD	Community Mass Drug Distributors
DOT	Directly Observed Therapy
FGD	Focus Group Discussion
FTS	Filariasis Test Strip
GHS	Ghana Health Service
GNTDCP	Ghana Neglected Tropical Disease Control Program
GPELF	A Global Program to Eliminate Lymphatic filariasis
GSS	Ghana Statistical Service
HBM	Health Believe Model
IDI	Individual Depth Interviews
IU	Implementation Units
ITN	Insecticide Treated Nets
KII	Key Informant Interviews
LF	Lymphatic Filariasis
MDA	Mass Drug Administration
MF	Micro-Filaremia

CN	Community Nurse
PC	Preventive chemotherapy
PI	Principal Investigator
TSA	Transmission Assessment Survey
UNDP	United Nation Development Program
WHO	Word Health Organization

OPERATIONAL DEFINITION OF CONCEPTS

Acceptability reflects people's decisions regarding their willingness to participate in a given intervention or wish to complete the required treatment. The concept is multifaceted and includes the perception of the intervention's appropriateness and importance, its suitability with socio-cultural beliefs, and its perceived effectiveness.

Mass Drug Administration: MDA is a preventive method that distributes anthelmintic drugs within a defined time interval to the entire population of a given geographical area without considering the individual infectious status.

Perception refers to the community's judgment, opinion, and views on implementing the mass drug administration program for lymphatic filariasis.

Social factors are factors related to the social context and inter-relationships that positively or negatively influence the community's perceptions of MDA's acceptability.

Health system factors are factors related to the organization, the resources (human, financial) provided, the action and effort expended for implementing the program that may influence its acceptability.

CHAPTER ONE

1 INTRODUCTION

1.1 Background

Lymphatic filariasis (LF), commonly known as elephantiasis, is a mosquito-borne disease, a leading cause of disability and chronic morbidity globally (World Health Organisation, 2016; WHO, 2019). Three species of filarial parasites are known to be responsible for LF infection: Wuchereria Bancrofti, Brugia Malayi, and B.timori (WHO, 2018). The estimation of the affected people worldwide in 2000 was at 120, with 40 million disfigured and disabled (WHO, 2019). India and Africa are the most affected areas by the disease, respectively, 49.2 % and 34.1 % of the infection(Dicko, 2017).

Over the last two decades, research has resulted in the development of new therapeutic schemes and strategies that have brought significant progress in the control of lymphatic filariasis leading to the Global Program's establishment for the Elimination of Lymphatic Filariasis (GPELF) (OMS, 2015). Since 2000, the GPELF has been launched in many endemic countries where its prevalence is above the established critical threshold.

The program's main objective is to interrupt the disease's transmission through the implementation of a Chemoprevention, which consists of a mass drug administration (MDA) as a strategy to eliminate LF as a public health problem by 2020 (WHO, 2018). MDA is yearly implemented with a therapeutic scheme that combines a single dose of two drugs: ivermectin and albendazole, where onchocerciasis is co-endemic or diethylcarbamazine albendazole, where onchocerciasis is not co-endemic (OMS, 2015).

To eliminate lymphatic filariasis, acceptability and compliance towards mass drug administration remain essential components. It is also worth noting that even when the MDA program's coverage is reported as satisfactory in several studies, there is a considerable gap

between coverage and acceptability. (Shuford and al., 2016). Identifying factors associated with low acceptability of the MDA in endemic areas, particularly those that remain above the WHO elimination threshold (microfilariasis of 1% or antigenemia of 2%), would help achieve the objective of eliminating LF by 2020 (Dicko, 2017).

Ghana is one of the LF endemic countries and was the first West African country to implement MDA for the elimination of the disease. Before the MDA launch in 2000, LF was endemic in 49 of the 110 districts existing in Ghana. The endemic Districts that were designed as Implementation Units (IUs) increased from 49 out of 110 Districts to 98 out of 116 Districts between 2003 and 2012 due to the administrative reorganization that has occurred in the country(Biritwum, de Souza, et al., 2017). The number of MDA rounds undertaken across the country since 2000 varies from 13 to 17 (***Ghana Neglected Tropical Disease Control Program 2019, unpublished data).*** However, some districts, referred to as "hot spots," remain endemic with prevalence above the threshold required to stop disease transmission (Biritwum, de Souza, et al., 2017).

Results from studies reported that several factors are linked to the persistence of the disease in these areas; these include high levels of non-compliance, adverse reactions to the drugs, low therapeutic coverage, poor adherence to the MDA programs (Rohit, 2018).

The present study examines the factors influencing the acceptability of the MDA program by the community to inform decision-makers about their knowledge, perceptions, and experiences of MDA campaigns for the elimination of LF.

1.2 Problem statement

Lymphatic filariasis is a neglected tropical disease that remains a significant public health problem in 49 countries worldwide, with 893 million people at risk. The infection is usually acquired in childhood and leads to profoundly debilitating consequences. Most cases present a permanent disability in adulthood due to lymphedema, hydrocele, and elephantiasis (WHO, 2019). In 2019, WHO estimated that among the people affected by LF, 25 million men presented with hydrocele and over 15 million people with lymphedema. Presently, at least 36 million people live with these chronic diseases (WHO, 2019). LF disproportionately affects poor populations and perpetuates existing relationships between illness and poverty (Hotez et al., 2009). LF contributes to decreased productivity in economic activities each year, estimated at hundreds of millions of dollars globally (Ramaiah et al. 2000).

MDA treatment, as preventive chemotherapy, reduces the density of circulating microfilariae in the blood of infected persons and then contributes to the reduction of the infection prevalence in the community. Stopping LF transmission implies reducing the infection below the level at which transmission can no longer be sustained, and therefore, new infections interrupted. Reaching this aim requires several rounds of MDA estimated by WHO at five or six consecutive annual rounds with a coverage of at least 65% of the total population at-risk (WHO, 2016). However, despite the WHO Member States' commitment to eliminating the disease, the implementation of the strategy in many endemic areas is not satisfactory and low compliance to treatment is one reason (Biritwum, de Souza, et al., 2017). Findings from several studies reveal that communities' lack of knowledge and information about lymphatic filariasis and the mass drug administration campaigns influences their choice to take the medication. Besides, information on MDA was found to be more likely accepted by the population if it comes from a trusted source within the community (Ames et al., 2019).

Ghana started implementing MDA campaigns in 2000 in 10 endemic districts and extended it to the rest of the country in 2006. Before the first annual round of MDA, the prevalence of microfilaremia (MF) was estimated between 19.8% and 29.6%, and immunochromatographic test (ICT) prevalence was between 33.1% and 45.4% (Biritwum et al., 2016). Since the inception of MDA, 83 districts out of 98 have reduced their LF prevalence to less than 1%. However, LF persists in the15 hotspots districts with a prevalence ranging from 2.2% (FTS) to 8.4% (FTS) even after more than 13 rounds of MDA with coverage higher than 81%. ***(Ghana Neglected Tropical Disease Control Program 2019, unpublished data).*** Notably, less than half the population of Ghana lives in LF endemic Districts, and the majority are in urban areas where MDA faces several challenges (Biritwum, de Souza, et al., 2017). In 2019, the Ghana Neglected Tropical Disease Control Program estimated place the treatable population at 1,169,357.

After 13 to 17 rounds of MDA with coverage varying from 81.22% to 89.28% *(Ghana Neglected Tropical Disease Control Program, 2019)*, it is important to explore factors associated with the MDA's acceptability among communities and to determine the barriers and facilitators to the implementation of the strategy. This information will enable decision-makers to adopt strategies that will facilitate future community acceptance of the intervention (MDA campaign) to eliminate lymphatic filariasis.

1.3 Justification

Issues related to MDA acceptability for lymphatic filariasis have been raised in many studies as one of the leading causes of the disease's persistence (Ames et al., 2019). Mathematical models predict that even with a more efficacious MDA regimen, LF elimination will not be achieved unless the treatment acceptability is maximized (Irvine et al., 2017).

Since the LF elimination timelines (2020) cannot be achievable in Ghana ***(GNTDCP 2019)***, it is necessary to identify factors associated with the disease's persistence in the 15 hotspot districts. Therefore, assessing factors related to the acceptability of the mass drug administration for lymphatic filariasis will provide key indicators on local perceptions and community preferences toward MDA and will help to better guide future interventions for better acceptability by the community

1.4 Research questions

1- What are community members' knowledge of lymphatic filariasis?

2- What are community members' perceptions toward the Mass Drug Administration program for lymphatic filariasis?

3- What are the barriers and facilitators to the implementation of the Mass Drug Administration strategy?

1.5 Research objectives

1.5.1 General objective

This study's general objective was to explore factors associated with the acceptability of the Mass Drug Administration for lymphatic filariasis among communities in Bole district, Savanah Region.

1.5.2 Specific objectives

1- To assess the knowledge of community members on lymphatic filariasis.

2- To describe community members' perceptions regarding the mass drug administration program for lymphatic filariasis.

3- To identify barriers and facilitators to the MDA's acceptability for lymphatic filariasis.

1.6 Conceptual framework

1.6.1 Narrative of the framework

This study is underpinned by the theory of the health belief model, which, through its constructs, helps to explore factors associated with the acceptability of the MDA by the community at the individual level.

The Health Belief Model is theory based on the assumption that the acceptability of preventive measures against an illness is determined by certain constructs related to the attitudes and beliefs of individuals. These are mainly: the perceived susceptibility, the perceived severity, the perceived benefits, the perceived barriers, the self-efficacy, and the cues to action (Cao et al., 2014). The theory is used in health services to explain and predict preventive health behavior and understand program acceptance issues and compliance with medical treatment (Abraham & Sheeran, 2014).

This conceptual framework is made up of 5 factors, each containing some constructs of the HBM theory. These include: the socio-demographic characteristics, the knowledge on LF, the perception of MDA, the socio-cultural factors, and health system factors associated with the program's acceptability.

Firstly, the community's knowledge of lymphatic filariasis refers to the perceived susceptibility and perceived severity of the health belief model. The perceived susceptibility, which determines the individual's belief about their chances or risks of getting the health condition (Reitz & Graham, 2018) is linked with how community members perceive their risk of contracting lymphatic filariasis. These opinions and beliefs are critical components of the acceptability of the MDA program. On the other hand, the perceived severity that has the same importance as the perceived susceptibility in the acceptability process focuses on how people consider or judge the condition's seriousness and consequences (Reitz & Graham, 2018). In

this study, the construct is related to how community members think about how serious being infected by LF is and if the disease's consequences are worthy enough to lead them to accept the MDA program and comply with the drugs' uptake.

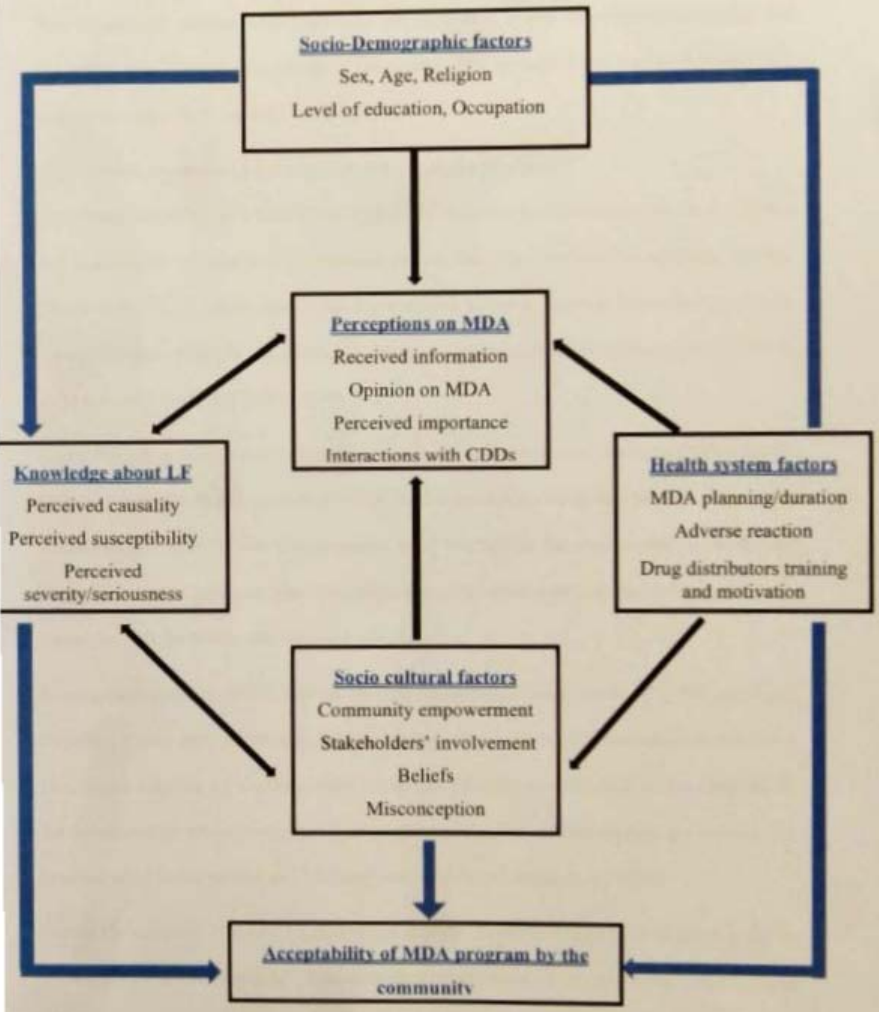
Secondly, perception of mass drug administration related factors will permit us to determine whether the program is perceived as efficacious to reduce the risk of being infected by LF or to cure the condition for infected people at the first stage. The perceived benefits in the framework are linked to the perceived importance of the program. They are influenced by socio-cultural and health system factors, knowledge of the disease, and perception of the MDA.

Thirdly, the perceived barriers refer to a person's feelings on the obstacles to performing the recommended health action or overcoming possible barriers that may arise due to taking it (Abraham & Sheeran, 2014). Barriers can be related to the behavior's performance, which may be inconvenient, expensive, painful, or unpleasant (Cao et al., 2014). In this study, barriers are informed by the MDA campaign's timing, the fear of side effects, misconceptions, and beliefs that lead the community to have unfavorable perceptions of the MDA.

Fourthly, the internal and external events (Cao et al., 2014) which motivate people to accept the MDA program, are supported by the cues to action the health beliefs model. As stated above, those factors can be at the individual level, such as the physical symptoms of the LF, related experience with a family member, or the environmental level such as LF awareness, stakeholder involvement, community empowerment, mass drug distributors training, and motivation. In the context of this study, the cues to action are "the stimulus needed to trigger the decision-making process" (Janz et al., 1984) to accept the MDA in the context of LF.

However, the Health Belief Model has no standard conceptual framework, therefore the following conceptual framework was developed based on the information obtained from the literature review and more specifically from the different constructs that compose the theoretical model.

1.6.2 Conceptual framework



2 LITERATURE REVIEW

This chapter presents a literature review on LF in general and factors associated with the mass drug administration (MDA) program's acceptability. The study includes the global burden and distribution of the disease, LF transmission and symptoms, its control and elimination program, the community members' knowledge of the disease, their perceptions on the MDA, the barrier, and facilitators to the program's acceptability.

2.1 Global Burden and distribution of Lymphatic filariasis

Lymphatic filariasis is one of the seven significant neglected tropical diseases by its prevalence and amenability to control. The condition causes the most considerable disability globally (Hotez et al., 2009). After malaria, LF is considered the most common vector-borne parasitic disease (Koudou et al., 2018), which constitutes a significant cause of morbidity and disability in 74 countries globally (WHO, 2019).

About 80% of patients living with LF live in low and middle-income countries (WHO, 2016). Its prevalence in Africa is particularly high, with a predominance in sub-Saharan Africa. The disease affects more than 40 million people, with Wuchereria Bancrofti as the filarial species responsible for the infection. The other major part of the remainder is shared between Asia, the Americas, and the Pacific (Dhikrullahi, 2017).

Elephantiasis is transmitted to humans through mosquitos, divided into five (5) different types, including Culex spp, Aedes spp, Anopheles spp, Mansonia spp Ochlerotatus. Anophelines (Anopheles gambiae s.l. Complexx and Anopheles Funestus) are the most vectors responsible for the disease in African rural areas, and culicines (Culex quinquefasciatus) the primary one in urban areas in the eastern and southern parts of Africa (Opoku et al., 2018).

Before the inception of the MDA campaigns in 2000, 49 districts out of 110 districts in Ghana were reported as endemic to LF. Following the redeployment of administrative districts by the

Ministry of Local Government from 2003 to 2012, the number of districts endemic to the LF increased to 98 districts out of a total of 216 districts (Biritwum, de Souza, et al., 2017). Whole districts in the Northern, Upper West, and Upper East regions were endemic to LF at the baseline (Biritwum et al., 2016). Rural areas record the disease's burden across the country, with W. bancrofti as filarial parasite and Culex mosquitoes as a vector in most cases (Dhikrullahi, 2017).

The Ghana LF program has made significant progress towards eliminating LF in the 15 previous years by reaching 74 million people in terms of treatment in the 98 endemic districts across the country. By 2016, 81 districts had become stopped-MDA after TAS were conducted; improvement was noticed in the country's northwestern part (Biritwum et al., 2016). But, it is important to highlight that less than a half of Ghana population, estimated at 27 million, live in endemic areas where the prevalence of the disease is higher than the recommended level for interruption of the infection transmission (1%), with the majority in an urban area where the effectiveness of the program remains a great challenge (Biritwum, de Souza, et al., 2017).

A cross-sectional study conducted in 2007 in the five start-up districts found a range of MF prevalence by district from 0.6% to 6.9%. Only the AES district MF prevalence was below the recommended level (0.6%) (Biritwum, de Souza, et al., 2017). Between 2004 and 2018, the Bole district recorded 14 rounds of MDA with a coverage rate ranging from 3.14% in 2004 to 81.22% in 2018. However, the disease's prevalence rate in the district remains the highest in 2019 among all endemic districts and varies unevenly from year to year. In 2014 the district recorded a prevalence of 5.6% (NBS); in 2017, the prevalence increased to 9.7% (FTS), and currently, it is at 8.4 (FTS). ***(Ghana Neglected Tropical Disease Control Program 2019, unpublished data)***

Considering all activities carried out so far in terms of MDA implementation, disease transmission should be interrupted. But due to therapeutic coverage, the prevalence and

infection intensity, compliance with the MDA program, and other socio-cultural factors, the disease is still persistent in several regions (Pi-Bansa et al., 2019).

2.2 Lymphatic filariasis transmission and symptoms

LF is transmitted to humans through female mosquitoes (Anopheles), which transmit filarial parasites into the body's lymphatic system, where they take refuge in the lymph nodes. Living in the lymph nodes, parasites can damage and block the lymph channels and prevent lymph from circulating in the body. The chronic manifestation of the disease known as elephantiasis of the upper and lower limbs is the direct result of the accumulation of lymph in the body's extremities. Some manifestations of LF begin with acute adenolymphagitis (ADL), which is often characterized by constitutional signs and symptoms such as fever, general malaise, pain, tenderness, and swelling (Dhikrullahi, 2017).

LF infection is acquired through three different filarial parasites categorized under the nematode of the family Filariodidea. They are *Wuchereria Bancrofti*, which causes 90% of the cases; Brugia Malayi is responsible for the most remainder of the issues and *Brugia Timori*. Adult worms in the lymphatic vessel affect the normal function of the lymphatic system and lead to the three manifestations of the disease, which are hydrocele, lymphedema, and elephantiasis. The parasite has an estimated life capacity of 6 to 8 years. It appears in the patient in adulthood by producing millions of microfilariae (immature larvae) circulating in the blood (WHO, 2019).

Interruption of LF transmission requires a decrease in MF intensity or vector density below the threshold to ensure that no new infections occur. Additionally, the infection transmission is affected by local environmental factors, which favor breeding and survival sites for adult mosquitoes; these factors include precipitation, temperature, humidity, and soil type. (GPELF, 2012). Dhikrullahi (2017) mentioned that a study conducted in 2015 by Aboagye-Antwi (2015) showed that some professional activities such as agriculture and fishing also expose the

population to the bite's anopheles' mosquitoes. Considering a community to be endemic depends on the density of MF in circulation, and for this purpose, it would have a low MF density when this density is less than 200 MF per ml of blood, an amount that is often detectable if the most commonly used blood collection techniques are used (Dhikrullahi, 2017).

Lymphatic filariasis is asymptomatic, acute, and chronic disease. In many cases, infections do not show any external signs but continue to transmit the parasite, injuring the lymphatic system and kidneys while altering the body's immune system. Once lymphatic filariasis reaches the chronic stage, it provokes a body deformity classified on three levels: lymphedema, which is the swelling of tissues, elephantiasis of the upper and lower limbs, which is characterized by a thickening of the skin or tissues and hydrocele, which in its turn manifests as scrotal swelling. Male and female breasts and genitals are not equally immune to the disease. LF physical manifestations are not without consequences for patients who are socially stigmatized and live in isolation on their communities' margins. LF often leads to mental health problems among patients, leads to the loss of income sources, increases spending on health care that finally leads to poverty (WHO, 2019).

Wuchereria bancrofti Life Cycle

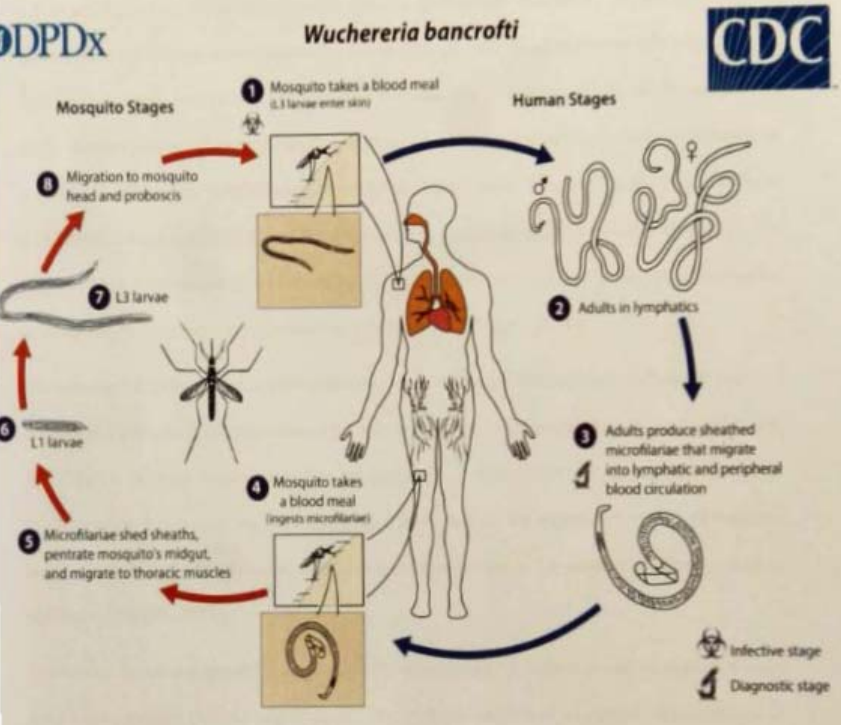


Figure 1. Wuchereria bancrofti Life Cycle

The figure represents the filarial worm's growth cycle, from the larval stage in mosquitoes to that of a complete adult worm in humans. It is essential to remind that cases of LF caused by W. Bancrofti are estimated at 90% (WHO, 2019).

Source: Centers for Disease Control and Prevention, Division of Parasitic Diseases, August 2019, https://www.cdc.gov/parasites/lymphaticfilariasis/biology.html.

2.3 Lymphatic filariasis control and elimination program

LF is among the six infectious considered to be "potentially eradicable "by the International Task Force for Disease Eradication (Gyapong et al., 2018). Its elimination as a public health problem was then initiated by World Health Assembly resolution WHA 50.29, adopted in 1997. In recognition of its eradicability, it urges all Member States to eliminate the disease as a priority health issue. WHO therefore established the Global Program for the Elimination of Lymphatic Filariasis (GPELF) in 2000 in response to this resolution (Kastner et al., 2015). The GPELF aims to eliminate LFs in all endemic countries by 2020, which is the target date in the organization's roadmap on neglected tropical diseases...(WHO, 2019).

Eliminating LF means reducing the infection below the targeted threshold of 1% in all endemic regions and providing lymphedema or hydrocele with the recommended basic package of care. The GPFLF strategy includes two key components: 1) to interrupt the spread of infection by implementing large-scale annual mass drug administration for eligible people in all endemic areas and 2) to provide recommended basic package of care to LF patients to alleviating their sufferance (WHO, 2019).

Preventive chemotherapy (PC) is effective for eliminating LF infection and consists of a mass drug administration (MDA) as a strategy. The strategy consists of an annual administration of anthelmintic drugs that are: ivermectin, diethylcarbamazine, and albendazole to treat the entire risk population living in endemic areas. The distribution of treatment through AMD is only recommended in an area if the prevalence threshold reaches 1%, a situation that promotes the sustainability of transmission and thus causes infection (WHO, 2018).

2.4 Community members and health worker's knowledge of lymphatic filariasis

Community knowledge about LF in endemic areas has often been reported in previous studies as low. Lack of knowledge of causal factors, mode of transmission, or clinical manifestations of the disease is the most reported aspect of the question (Heather et al., 2019). In most cases,

the disease etiology is attributed to supernatural phenomena or manifestations such as curses resulting from someone's misconduct toward someone else or communities. In a study conducted in New Guinea, for instance, it was indicated that chronic hydrocele was considered to be the result of a curse on an individual who had stolen from a betel nut plantation. Moreover, elephantiasis' clinical manifestations are in most findings associated with witchcraft (Wynd et al., 2007a).

Being at risk of getting the disease is differently understood among community members. In India, findings showed that health workers were not worried about contracting the disease since they did not observe many lymphedema cases in their localities. In the same study, health workers mentioned no difference between elephantiasis and LF that the considered synonyms (Hussain et al., 2014).

In Tanzania, the fact of being at risk was associated with the perception of MDA by community drug distributors who believed that since they have taken the medication during MDA distribution, they are no more at risk of getting the disease. According to them, one dose of the drug provides long-lasting immunity against LF. About the severity of the LF, CDDs felt that hydrocele is the only form of LF which constitutes health issues but not elephantiasis. They did not make the difference between the two manifestations, and this was what they were transmitted at the community level during the MDA campaigns (Kisoka et al., 2016).

Knowledge of the illness is also usually associated with apparent signs such as the enlargement of body parts such as the scrotum and female genitalia. In studies conducted in Philippine and Papua New Guinea, findings revealed that Recognizing the disease is based on its physical manifestation; just a few participants in those studies mentioned that LF could be LF asymptomatic (Amarillo et al., 2008; Wynd et al., 2007).

The Ghanaian context is not exempt from this situation. A study conducted in the northern region revealed that people from several endemic areas had little or no information on the disease and the MDA program. As reported in this study, community and drug distributors do not have sufficient knowledge about the disease and do not have the necessary information about MDAs. A lack of increased knowledge about the purpose of MDAs, their importance to communities, and the inclusion criteria were reported. The same study found that community mobilization and awareness sessions were not very effective in the disease control process (Manyeh et al., 2018).

2.5 Perception toward mass drug administration (MDA)

Community perceptions of the MDA program have been the subject of several previous studies where results have shown a more positive perception towards implementing the program (Kisoka et al., 2016; Babu & Satyanarayana, 2003). The perceived benefits of taking the drugs at the individual and community levels are highlighted to support their opinions. A qualitative study conducted in Tanzania in 2016, for example, reported that community leaders and mass distributors considered the MDA to be beneficial to the population as the drugs distributed during the campaigns prevent the disease by giving people immunity to LF and cure LF patients. Besides, the curative aspect of the medicines for other conditions parallel to LF is cited by some studies as positive factors in the program. (Kisoka et al., 2016; Shona et al., 2007). The same study in Tanzania reported the free medicines distributed as another factor explaining the positive appreciation of the program by the community (Kisoka et al., 2016a).

Previous studies have examined the process of mass administration as well as the people involved in this process. The results revealed that it was considered essential and necessary that the people in charge of distributing the drugs be members of the community because of the trustful relationship they share with them (Njomo et al., 2012). In some studies, preference is given to health workers for the drug distribution because of their health background, making

them more competent to carry out the distribution according to the community than CDDs who do not have the required training (Kisoka et al., 2016a).

However, although presented in several study reports as beneficial by the community, the studies' results also reported negative perceptions of MDAs. LF compared to other health problems is not perceived as a priority issue in some localities (Kisoka et al., 2016a), MDAs are considered non-beneficial or unnecessary by others (Babu & Satyanarayana, 2003) and, NGOs staff involved in the program implementation activities knew little about the rationale and benefit of MDAs (Amarillo et al., 2008).

Communities in various aspects raised suspicions related to the program's conduct and purpose. Free medicines negatively influence some who do not trust the health products distributed free of charge. Free drugs are perceived as always having a hidden or unstated purpose behind what the promoters are displaying, and in the context of MDAs, the aim is to kill the people who will consume the medicine. For these communities, free distribution is a means for the instigator to achieve their goal (Kisoka et al., 2016a).

In addition, community misconceptions about the program reported in the literature include the program's perception as a clinical experiment and a program intended to harm people's health; specifically, to make men impotent and prevent women from becoming pregnant or from reproducing. Rumors of side effects are also reported and described as factors associated with the development of serious pathologies or death ; Njomo et al., 2012). These side effects are among the significant reasons for noncompliance with the population reported in previous studies during MDA campaigns ; ; Shona et al., 2007). In general, the side effects reported are fever, dizziness, vomiting, nausea, severe itching and swelling of different parts of the bodies, and the lack of communication about these effects contribute to fueling rumors about the products and purposes of MDAs. The study conducted in Tanzania reports that some Participants were uncertain about the purpose of MDAs because of rumors circulating at that

time about the death of an individual in the community, whose cause was attributed to the drugs (Kisoka et al., 2016a).

The study conducted in Tanzania indicated LF is not perceived as a real health problem and, therefore, the importance of MDAs. Some also consider LF to be a disease that only affects the rural community and not urban areas. Another factor contributing to sowing doubt and preventing people from taking the drug is the program's implementation strategy. Misunderstanding due to measuring height instead of weight to determine the product's dosage to be taken is one of the reported factors that leads in the community view, a child to take more product than his father (Kisoka et al., 2016a).

In the program's operationalization, complaints have been made about a lack of information about its implementation's communication challenges. Information on MDAs does not reach all the population concerned, and training sessions for distribution agents are not organized in time (Hussain et al., 2014a). A qualitative study conducted in Kenya described the community's complaints about the information shared with them during the campaigns. Lack of adequate training and knowledge of MDAs by drug distributor agents limits their communication process capacity and their interaction with communities. As a result of this, communities do not participate and are unsure of their communication skills and knowledge of the program (Njomo et al., 2012).

2.6 Barriers to the acceptability of the MDA

Several factors affecting the acceptability of MDAs for LF have been raised in the literature. In the systematic review conducted by Krentel, reasons given for non-compliance were linked with many factors ranged from the broader program and delivery issues to individual recipient personal characteristics such as awareness and knowledge, perceived benefits and risks, adverse events (Krentel et al., (2013)

One of the significant challenges to the acceptability of MDAs raised in the literature is related to the side effects that result from taking the distributed drugs. Reported side-effects or adverse reactions from the anthelmintic drugs for LF were generally: swellings, dizziness, itching, rash, body pain, weakness, fever, and headache (Shuford et al., 2016). In Ghana, studies on LF have reported on this issue, which in most cases, was the major barrier to the acceptance of the program involving the acceptance of the drugs. For example, in a study conducted in 2018 by Ahorlu, it was reported that people were not taking the drugs because they were afraid of having reactions when swallowing them. As a result, they either refused to take the drugs outright or took them with the distributors and threw them away once they turned their backs. Refusal to take the medication was not just a personal experience. It was noted that even the lived experience by a third party such as a neighbor, friend, or relative was enough to cause people to reject the program (Ahorlu et al., 2018).

Poor knowledge of LF and MDAs is also reported as a challenge to the acceptability of medications. Amarillo's study results showed a significant association between knowledge of LF and the acceptability of MDAs. It was found that people who knew less about the disease were not taking the medication (Amarillo E. et al., 2008). Barriers such as the low-risk perception, the consideration of LF as a disease resulting from supernatural forces or defining the illness by its chronic and late-appearing manifestations were some of the reasons related to the knowledge that limits participation in MDAs. Consideration toward drugs as having curative rather than preventive power has also been associated with these challenges (Ahorlu et al., 2018).

Moreover, misconceptions around the program, such as considering drugs as products that make infertile or as a family planning program, were some of the reasons for some people's refusal to take the medications in existing literature (Kusi et al., 2020). Also, the communities were not well informed about the MDA implementation program. For some, not being

informed in advance of the distribution program or not having received information about the drugs' benefits, its side effects explain their refusal to take them at the time of distribution (Njomo et al., 2014). Also, in a study conducted in India, it was reported not having received information on MDAs as a hindering factor to medication acceptability (Hussain et al., 2014b).

Community engagement and involvement are another critical challenge to the acceptability of the MDA and not only in the implementation of MDAs for LF but also to other drug distribution programs. Non-community involvement often results in rumors spreading and mistrusting the program and the health system (Gyapong et al., 2018). In community involvement, the selection of dispersing agents according to community inking with the population's participation and the use of community leaders throughout the implementation process are emphasized. Situations where people have refused to take the drugs because they do not trust the people who distribute them have been raised in the literature (Kusi et al., 2020) (Amarillo E. et al., 2008). These studies have shown community leaders' involvement who have facilitated the acceptance of medicines by people who had rejected them and have managed the problems of trust and mistrust between communities and distributors.

Also, the motivation of community volunteers has been identified as a challenge in the acceptability of MDA in most studies and the time allocated to the distribution (Gyapong et al., 2018). Low remuneration and motivation of CDDs hinder them from doing their work correctly, and this negatively impacts the way they do their job and interact with people. For example, Health providers were interested in knowing how much they will be paid before they attend training for MDA. When remuneration was deemed small or inadequate, CDDs were affected, and interaction with communities became increasingly unpleasant. (Biritwum, Garshong, et al., 2017). The limited time allocated to the MDAs and the non-suitability of the implementation program to community activities are also factors that affect their willingness to accept the MDAs or not. Findings from Kussi showed that where working conditions were

deemed inadequate, distributors were not very sensitive to the communities and did not bother to go to areas where access was difficult. The same study also found that the quality of the work they provided and the mood they adopted during distribution were also affected. A survey conducted in Kenya found that the limited financial resources available for implementing the program are at the root of the distributors' low remuneration and high workloads (Kusi et al., 2020).

2.7 Facilitators toward the acceptability of the MDA

Previous studies have shown that there are many factors to consider in administering MDAs to ensure acceptability and compliance at the population level. These factors encompass the way drugs are administered, the distributors' identity, and their relationship with the community. Other important factors have also been identified: community-based organizations, training, and motivation of distributors. All these factors have been cited in several studies as having an important impact on the acceptability of MDAs (Krentel et al., 2013).

The acceptability of the program is found to be linked with the relationship between distributors and the community. It is observed that if the distributors are from the same neighborhood, the acceptability trend is positive and, most importantly, if everyone knows them. Conversely, external distributors do not positively influence compliance with the strategy, and populations are often hostile towards them. CDDs are the intermediary between the program and the community, and therefore, their identifications must take these aspects into account. Demonstration of the intake of medication by distributors is another motivating factor. A study in India reported that compliance was positive when CDDS took drugs in front of the community and made instant home visits (Babu & Satyanarayana, 2003).

The interaction between drug distributors and communities and their involvement in the implementation of campaigns were other key factors that emerged in previous studies. This factor includes good collaboration with them, recognizing communities as fundamental actors,

nd not just receptionists of the program but also through community organizations and etworks such as churches. These organizations have the public's trust and can operate fficiently and effectively (Nandha et al., 2007). A study conducted in American Samoa ientions this state and illustrates how church involvement has helped improve the compliance nd acceptability rate of MDAs (King, 2011).

.8 Conclusion of literature review

Overall, it can be observed that the issue of lymphatic filariasis and especially the general nowledge of the disease and the perceptions about the Mass Drug Administration program as been widely researched around the world. In addition, it is also observed that the Mass Drug Administration program for LF has been proven to be an effective program in the control f the disease if effectively implemented with effective community and stakeholder articipation. However, despite the recognition of the effectiveness of the MDA program, it ppears that the acceptance of the program by the communities is still a problem in some ndemic localities where the prevalence of the disease is still high. It is therefore important and ecessary to explore factors influencing the acceptability of the MDA program by the ommunity within Bole District in the Savanah Region of Ghana.

CHAPTER THREE

3 METHODS

This chapter presents the method used by describing the study design, location, and population in the first section and the second section, the study procedures. The study procedures include the sample and sampling techniques, the data collection tools and analysis, the quality control strategies and the ethical considerations that have been used.

3.1 Risk communication and public education on COVID-19

Given the current health situation, health education and risk communication have been conducted among the research team and potential participants before the study. Research assistants were first trained on the COVID-19 Pandemic and its prevention measures, and then they held individual awareness-raising activities with volunteers on the study site. The education messages focused on the disease, how it is spread, the risks of contamination, how they can act to protect themselves and others, and why they should respect national directives.

3.2 Study design

This was a qualitative study using phenomenology and narrative designs.

The phenomenology is a design used "to understand phenomena from the perspective of those who experience it. The aim is to know the experience of how the participants know it, understand the meanings they attach to it and capture the essence of a phenomenon as they experience it (Collingridge & Gantt, 2008). The design in this study's specific context has concerned the community members who, during data collection, narrated their personal experiences with LF and the MDAs.

The narrative approach has been used with nurse and drug distributors who described the communities' knowledge and experiences with LF and the MDA. The narrative approach is a design defined by Czarniawska (2004) by Creswell (2007) as an approach in which " narrative

is understood as a spoken or written text giving an account of an event/action or series of events/actions, chronologically connected" (Creswell et al., 2007).

Therefore, both approaches helped to understand factors related to MDA's acceptability by describing the acceptability patterns and the barriers and facilitators associated with it.

3.3 Study location

Ghana is a country located in West Africa with a surface area of 238,537 km². In 2014, the population was estimated at 27 million by the GSS, with the majority (51%) in urban areas (Ghana Statistical Service, 2014).

The present study was conducted in Bole District, one of the highest Lymphatic filariasis prevalence (8.4% FTS) (***Ghana Neglected Tropical Disease Control Program 2019, unpublished data)*** countrywide. In 2010, the district population, according to the Population and Housing Census, was 61,593, of which the majority (79%) live in rural localities. The community was composed of 51.4% males and 49.6% females (Ghana Statistical Service, 2014) with an essential ethnic diversity within the population of which majority (UNDP Ghana Office Accra, 2011). Agriculture is the predominant activity in the district, with almost 83.5% of the people concerned. Other jobs in the community include agro-processing, mining, and artisanal activities. Safe sanitation is not improved, and 86.6% of the population does not have access. In terms of health, malaria is the major problem in the district, and ITN is a preventive strategy to handle the disease (UNDP Ghana Office Accra, 2011). 2.3% of the population in the District was disabled in 2010 (1,446/61,593), with the physical form as one of the leading disabilities (25%) (Ghana Statistical Service, 2014). The district counts eight health facilities, a district hospital, five health centers, two clinics, and 5 CHIPS Compounds (UNDP Ghana Office Accra, 2011).

MAP OF THE STUDY LOCATION

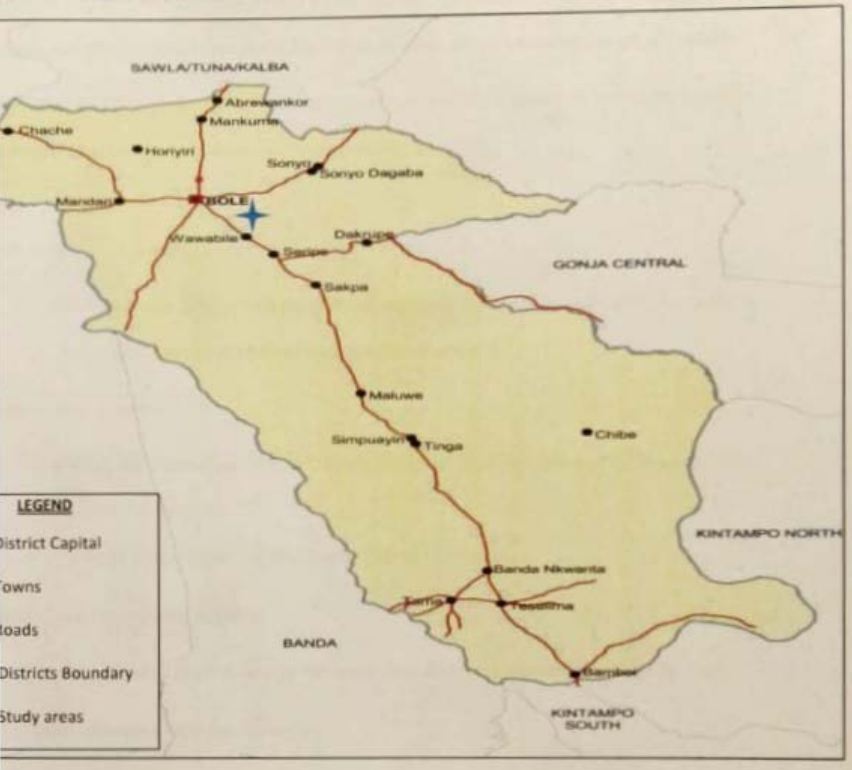


Figure 2: Administrative map of Bole District, Ghana, (Adapted from Ghana Statistical Service) (Ghana Statistical Service, 2014).

3.4 Study population

The study population for this study included four (4) different categories of participants within the community. The first group was composed of community members who represent the

primary target population. The second group included: community drug distributors (CDDs), nurse, and community leaders in the Bole district; those are the secondary target population.

For research ethic purpose, only community members aged 18 years old and above (capable enough to make their own decisions) were included.

3.5 ETHICA

All categories of participants

- ✓ Willingness to comply with the national measures for the control of COVID-19 and the researchers' specific directives during research activities.

Community members

- ✓ Having been a resident of Bole District during the implementation of the last mass drug distribution Program.
- ✓ To be 18 years of age and able to give informed consent.

Mass Drug Distributors & Nurse

- ✓ Having participated at least in one mass drug distribution campaign for LF in Bole.

Lymphatic filariasis Program Managers

- ✓ Having a minimum of one year of experience in LF program management in Bole.

3.6 Exclusion Criteria

Were not included in this study:

- ✓ Any person who was unwilling to participate in the study
- ✓ Any person with mental challenges
- ✓ Any person who had never heard of the Mass Drug Administration for lymphatic filariasis.

3.7 Sampling Method

3.7.1 Sample and saturation determination

The estimated number of interviews was based on Guess et al.'s work in 2006 in which findings showed that at six interviews, data saturation is about 70%, and at 12 interviews, the saturation reaches 92% (Guest & Johnson, 2006). Notwithstanding, in the first stage of the data collection process, 23 interviews were conducted with the study participants before undertaking the first round of analysis to verify the saturation. This analysis was conducted by an evaluation team, including the principal investigator and an independent consultant, to establish and ensure the analysis's strength and reliability. After the first check-up, three more interviews were conducted to ensure that no new themes or ideas emerged before the evaluation team concluded that saturation was achieved. Hence, a total of 26 interviews was held with the study population. For the data saturation's determination, a comparison was made during and after the data collection process.

3.7.2 Sampling techniques

Participants were identified and recruited using stratified purposive sample and critical case sampling techniques both from the non-probabilistic sampling family.

A stratified purposive sample is a sampling technique where "the researcher first selects the particular categories or groups of cases that he/she considers should be purposively included in the final sample. The sample is then "stratified" according to these categories, and finally, a target number of participants are allocated to each of the strates" (Robinson, 2014). The aim is to capture the significant variations (Palinkas et al., 2015) in the acceptability of the MDA within the community. In this study, the technique was used to identify community members and community drug distributors at the community level by considering the following characteristics: sex, age, education level, and religion.

A critical case sampling technique was employed to select community leaders and nurse who are the study's key informants. The method, as cited by Guetterman in Planton (2015), consists of "selecting a small number of important cases to "yield the most information and have the greatest impact on the development of knowledge" (Guetterman, 2015). Thus, Participants from this category will be selected based on their diverse knowledge, experiences, and involvement in the implementation of MDA programs.

3.8 Data Collection methods

Two (2) data collections techniques were used in the study. Employing multiple data collection methods allows comparing findings in analysis for convergence or divergence (triangulation, constant comparative method) (Trotter, 2017). The study used:

3.8.1 Individual Depth Interviews:

Individual Depth Interviews IDIs are considered the primary or sole source of data collection in qualitative research designed to explore and understand depth a topic of interest (Trotter, 2017). IDIs were conducted with community members at the community level using local dialects as the main language for data collection. Interviews were conducted by the principal investigator and trained research assistants in the form of an audio recording, which averagely lasted about 35 to 70 minutes. Also, field notes were taken and used later in the analysis stage.

3.8.2 Key Informant Interviews (KIIs)

A Key Informant may be described as an individual who is likely to provide needed information, ideas, and insights on a subject of interest. KIIs was organized with nurse and community leaders to discuss significant challenges the program is facing, their interactions with the community, and recommendation for the MDA's better acceptability. Interviews were recorded, and the duration was the same as the IDS's.

3.9 Data Collection Tool

Data collection guides were developed for all the techniques that have been used in the study. First, there have been interviews guides designed for community members and mass drug distributors. The tools were structured around semi-structured questions on the following themes: the socio-demographic characteristics of the participants, their knowledge of LF as their perception of the causality, severity, and susceptibility. Their experiences and perceptions of MDAs based on the information provided and their interactions with distributors during the campaigns.

The second guide that was developed was for community nurses. It focused on the organization and implementation of the campaigns in collaboration with MDD and the community members.

Interview guides were designed to describe the communication process related to the awareness of lymphatic filariasis and Mass drug administration with the key informants. Information about the organization of the campaigns and major challenges in the implementation was collected.

The last theme addressed by all interviews' guides was that of barriers and facilitators to the acceptability of MDAs in the context of each category of participants.

3.10 Data Analysis

Once the data saturation was confirmed with the first analyses, the interviews were listened to about two times before proceeding to the English transcription verbatim. All transcripts were quality checked and then imported into NVivo version 12 for coding. Thematic analysis has been used through an iterative process using inductive and deductive coding. A codebook was created according to the study objectives and the field data. The transcriptions were read one by one, and the deductive codes were applied first throughout the reading process. Inductive codes were detected and progressively integrated into the codebook through the generation of new themes. The generated codes were then classified into themes and sub-themes based on

3.12 Ethical Considerations

3.12.1 Ethical clearance

The study's protocol was approved by the Ethical Review Committee of Ghana Health Service (GHS-ERC 031/02/20). Besides, permission was sought from the Bole District Director of Health Services as well as community leaders before carrying out the study.

3.12.2 Informed consent

The objectives of the study were clearly defined and explained to all potential participants before seeking their consent. For a need to understand well before consenting, consent forms were read and translated into the local language where it is necessary. Potential participants were informed that their participation in the study was entirely voluntary. They have the right not to answer a question if it bothers them and withdraw from the interview at any time point of the interview without giving explanations and expecting any consequences. Then, written consent was asked to them. After obtaining permission, interviews were organized according to the participants' availability, and the time and place of the meeting were discussed with them prior to interviews.

3.12.3 Confidentiality and privacy

Confidentiality and anonymity were respected by the research team and assured to participants before the start of activities. For IDIs and KIIs' identification during data entry and analysis, anonymous labels have been assigned to each of them. Participants were reassured that the information they share would only be used for this study. All field data have been stored on the PI's personal computer, and access to data is limited to the restricted research team.

The Participants' privacy was also respected, and interviews were conducted only at locations identified by the participants and appeared comfortable. No personal information, such as the Participants' name or address, has been disclosed or seen on the study or publication report.

3.12.4 Potential Benefits and Risks

There was no direct benefit for participants to take part in this study. However, the research results may be an asset in the existing literature by generating new knowledge on the acceptability of MDAs by communities. It may also guide future interventions in the field.

3.12.5 Compensation

No payment in any form (money, material) was made as compensation for participating in this study. However, there was juice and water distribution for refreshment purposes during the discussions, and transport prices were also returned to the participants.

3.12.6 Data Management and security

All data from the field is under the direct responsibility of the Principal Investigator. Paper files such as consent forms, field notes have been stored in filing cabinets and kept in a locked space. Audio files (IDI and FGD recording) and transcripts are stored on the IP computer and protected by a password. Access to the data has been restricted and therefore limited only to the principal investigator, co-investigators, and study supervisors. No personal identifiers were used for data archiving to guarantee anonymity

3.12.7 Dissemination

A research report has been written, and then a presentation made at the School of Public Health of the University of Ghana. A copy of the report has been made available to the school library, the Bole district regional health directorate, and WHO (sponsor of the study). The researcher also plans to write scientific articles through the study results for publication in academic journals.

CHAPTER FOUR

4 RESULTS

In this chapter, findings from the data collected in this study's research question is presented. The results are organized around five main themes, which include: the sociodemographic characteristics of the participants, community, and community drug distributors' knowledge of lymphatic filariasis, their perceptions of the Mass Drug Administration's program, the barriers to the acceptability of the program by the communities, as well as the facilitators.

4.1 Sociodemographic characteristics of the participant

Overall, 26 interviews were conducted in four sub-districts of the Bole Health District, including two urban sub-districts (Zampe and Kapurepe) and two rural sub-districts (Mankuma and Mandari). The study participants were composed of 13 community members (7 women and five men), seven community drug distributors (3 women and four men), five nurses (2 women and three men), and a community leader. The age of participants ranged between 19 and 70 years old. Thirteen participants were respectively selected from the urban and rural areas. A majority of the community members had never been to school (11 members over 13), whereas 4 out of 7 of the drug distributors had completed at least secondary school. Most participants (22/26) were married across all categories, and three others were single.

Regarding participants' occupation, agriculture and commerce were the dominant activities cited by community members and drug dispensers, with 4 in each category. As for the nurses, their positions within the visited health facilities included a Senior Enrolled Nurse, 3 Principal Nursing Officer, and one disease control officer. A further description of the sociodemographic characteristics of the participants is presented in the table below.

Table of Socio-demographic Characteristic of Participants

Socio-demographic characteristics		Community members	Drug distributors	Nurses	Community leader
Urban sub-district	Kapurepe	4	1	1	
	Zampe	4	1	2	
Rural sub-district	Mandari	3	2	1	1
	Mankuma	2	3	1	
Sex	Female	7	3	2	
	Male	5	4	3	1
AGE	19- 35	6	5	2	
	36- 51	4	2	3	
	52 & above	3	0	0	1
Marital status	Single	0	4	0	
	Married	12	3	5	1
	Widow	1	0	0	
Religion	Christianity	4	1	3	
	Islam	9	6	1	
Level of education	Secondary	2	2		1
	Tertiary	1	2	7	
	No education	10	3		1
Occupation	Farmer	3	3		
	Trader	5	0		
	Housewife	2	2		
	Student	0	2		
	Teacher	1	0		
	No occupation	2	0		
Nurses' position	Senior Enrolled Nurse			1	
	Principal Nursing Officer			3	
	Disease control officer			1	

4.2 Community members 'knowledge of lymphatic filariasis

In this first theme, six main sub-themes are presented based on the field data analysis. These are the attribution of LF to its chronic manifestations by community members, their knowledge of its causes, prevention, perceived severity, and susceptibility to getting the condition.

4.2.1 Attribution of LF to its chronic manifestations

Almost all community members asked about what is LF, attributed the disease to its only chronic manifestations, which are hydrocele and Elephantiasis. For them, lymphatic filariasis is the same as Elephantiasis, known as " Keeyapini" in the Gonja language, which means "Mortar leg." They stated that the disease is recognized through an abnormal and apparent swelling of certain parts of the infected body, such as the feet, scrotum, breasts, or arms, which, at first glance, makes the disease visible. A participant asked about the issue described the condition as follows:

> *"It is something that normally makes someone leg to get swollen like that of an elephant. When we were children, we called it a big leg, or like Elephantiasis. That is what I know about Elephantiasis…the leg is always swollen very big, and that is what we see and say that the person has elephantiasis"*. ***CM_Male_No occupation_25_Kapurepe***

Participants further described during the interviews the patients' physical deformities to illustrate their knowledge better. Such descriptions were sometimes attributed to the roughness of the affected limbs, which according to some people, lose the sensation of pain because blood no longer circulates in these parts of the body, or to the bad smell release due to the infection with itching and blistering, contributing ultimately to the patient's disability.

> *"Elephantiasis, one can't know because getting it involves a lot….if you get it, it starts itching you; the leg becomes swollen and heavy. If you knock or hit it, it doesn't pain you. It doesn't pain because the blood does not reach there, or blood is too over. That is what Elephantiasis is"*. ***CM_Male_Trader_30_Mankuma***

However, a few participants mentioned the asymptomatic nature of the disease in the early stages of infection. The onset of visible symptoms of the disease, they said, occurs only in the later stages, and therefore there is no way for someone to recognize the illness unless blood tests are performed to determine its presence or not. Thus, health providers are seen by these participants as the ones having the skills for early detection of LF. As for the community, only the physical deformities of the body resulting from infection can alert them to the disease. An illustration of this opinion is found in the following quote from a community member who said:

> *"One cannot tell unless those educated (doctors, nurses) will know it. Because of the conduct test. They can only tell if a test is conducted. But some of us, it is, until it affects the leg that we get to know. Some it affects their breast. And some men, it affects their testicle of the testes..."*
>
> ***CM_Female_Housewife_70_Kapurepe***

4.2.2 Knowledge of LF causes

Similarly to the general knowledge regarding lymphatic filariasis, community members overwhelmingly associated the disease's causes and transmission modes with spiritual forces, dietary, animals, and hereditary aspects.

4.2.2.1 LF as a spiritual disease

For many participants, lymphatic filariasis results from supernatural forces manifesting in witchcraft, spells, curses, or attribute to some animals. Social quarrels or bad motives may lead some people to harm others by using spells in their food or roads for these participants. They explained that disease transmission usually occurs when a person inadvertently steps on charms placed on the road or eats a meal mixed with a spell. To them, this "black magic" is one of the reasons for the persistence of the disease. A Participant stated in this regard:

> *"It is still there with some people, and they keep it in the darkness. That is why the disease still gets people. It is not the drug that is not helping them, but they keep it in darkness. Like someone*

will put poison on the ground for a colleague to step on. With that one, the drug cannot cure it...if someone wants you with it, he can pass through that and give it to you". ***CM_Female_Trader_54_Zampe***

Some believe that stepping on the tail of a wall gecko or a lizard known as "Ebuwura" in the Gonja language also causes the disease. An illustration of this is: *"Elephantiasis occurs when stepped on the tail of wall gecko with your barefoot."* ***CM_Female_ Housewife _70_Kapurepe***

4.2.2.2 LF as a contagious disease

Other participants supported the idea that lymphatic filariasis is a contagious disease transmitted from human to human through physical contact with an infected person. According to these participants, the transmission of the disease can be direct, i.e., through physical contact with the sick person, such as touching them, or indirectly through contact with the ill person's belongings such as shoes or clothes. Exchanging shoes or clothes with LF patients, sharing food, or mingling with them is one disease source. This is an opinion that was shared by several participants.

"Because it is contagious. When someone has it, and your leg touches the person's leg, you can get it." ***CM_Female_ Housewife _70_Kapurepe***

" Those days, the kind of food and water used to drink. If someone had it and walks through water, and you also step on the same water, you will definitely have it. That's why those diseases were many." ***CM_Female_Farmer_32_ Kapurepe***

4.2.2.3 Animal-related causes

Other causes of the disease cited by some participants were of animal origins such as lizard, wall gecko, or bat. They believed that eating bats or stepping on a lizard or a wall gecko gives the disease in the long run. Insects such as "cheche flea" usually found, according to the participants around the riverbanks, were also cited as a vector of the parasite.

"I: So, what causes the disease? R: Hmmm, I think it is what we eat, for example, some bush meat such as bat, if you eat bat you can get it, yes..." ***CM_Female_Trader_40_Zampe***

"They said that when an insect bites you, you are likely to get it and those insects I think they said it is a cheche flea just a flea and when it bites you, you can get it." ***CM_Male_Teacher_35_Zampe***

4.2.2.4 LF is a hereditary disease

For others, the disease is merely hereditary. As in the case of other hereditary diseases, through the clan, the line, or the family, one can get LF, and unless in such case, one can mingle and interact with LF patients without any risk or fear of contamination. *"...Others can also get it through hereditary. Every family or clan has its own hereditary diseases that affect them, and Elephantiasis, as I know, is one of those one"* ***CM_Female_ Housewife _70_Kapurepe***

The nurses asked about communities' knowledge of the disease came back to these prevailing misconceptions that they deplored after all the awareness sessions on the condition that were organized within the community. In the same way, they acknowledged that change on the communities' mentality about LF could be changed by intensifying educational sessions on the disease.

"Like people attributing those kinds of things to witchcraft (laugh). Some don't believe it is just the bite of a mosquito; some think it is a curse, and some always think it is witchcraft. But it always left on to us to let them know the cause..." ***CN_Female_Nurse_42_ Zampe***

4.2.3 Community members knowledge regarding LF prevention

All participants interviewed agreed that LF is a preventive disease, although they diverged regarding the preventive measures required. Along with the causes of LF mentioned by each participant, the preventive measures cited were relative to them. The data show that for some, preventing the disease involves taking care of what we eat, like boiling the unclean water before drinking or not stepping on the tails of wall geckos or lizards. For others, it requires sensitizing

people with evil intentions not to throw spells on others. An illustrative example of such opinions is described in the following statement of this participant describing how to prevent LF:

> *"by the grace of God, we can prevent it. They should continue talking to us, like if you want to add darkness to it, please stop it. if you add darkness to it and it is still in your house and so... if they talk to you, you will stop..."* ***CM_Female_Trader_54_Zampe***

However, the findings show that despite the variety of knowledge surrounding LF's causes, many participants cited the anti-helminthic drugs distributed during the MDA campaigns as a preventive measure against the disease.

> *"Once you take the drugs, it is something that can prevent you from the disease; you can be prevented. Even if it is in your blood, the drug will cure it".* ***CM_Female_ Housewife _70_Kapurepe***

Another perspective that emerged from the data was the vector control of mosquitoes as a preventive strategy against the disease. For some participants, sleeping under mosquito nets or cleaning our living environment would help prevent lymphatic filariasis. One participant stated: *"If we are not bitten by those insects, I think that is a way we can prevent ourselves from getting it. So, maybe clearing out environment so that these insects cannot come that is one thing we can do..."* ***CM_Male_Teacher_35_Zampe***

4.2.4 Perceived severity of LF

The study findings show that LF is perceived as a severe and dangerous disease among all participants. However, the reasons given to support their views differed from each other with the following:

Disabling and deadly disease

For some, reasons that support LF's severity is its disabling and deadly feature. They explained that LF is a condition that prevents patients from performing their primary needs or daily

activities due to the deformities their bodies undergo. Thus, they are deprived of everyday mobility, work, and become a burden on their families and communities. According to them, this situation leads spontaneously to death, and some participants even mentioned that the condition is incurable. Alongside the sedentary life, especially sitting for a long time without movement, it will also contribute to giving LF in the long run.

> *"If you are affected by it, your leg becomes so big that you can't do anything for yourself. You are always indoors. So if you don't have anybody to take care of you, you will die just by thinking too much and worrying too much."* ***CM_Female_Farmer_32_ Kapurepe***

Social stigmatization

Social stigmatization due to LF is another factor explaining participants' perceptions of LF severity. LF patients are victims of constant social stigmatization. They are isolated from their friends and family who are afraid of being contaminated or are forced to hide not to discover the disease. Other reasons, such as physical disfiguration, the pain associated with the disease, has also been cited to explain how the disease can be dangerous.

> *"The disease can remove you from your peers; you cannot associate with peers. When one leg is bigger than the other, can you associate with peers again? It is a dangerous disease for people. So, everybody is praying the disease should get anyone."* ***CM_Female_Trader_54_Zampe***

A nurse speaking about the social stigmatization of LF patients said:

> *"They are there, but due to stigma, they are always hard to find. In addition to that, they wear long dresses to conceal the affected area... And even in a situation where the leg is too big, they even stay in-doors all the time. Though there have been several educations on stigmatization, it's still very rampant in this part of our world..."* ***CN_Male_49_Bole***

4.2.5 LF Risk perceptions

The findings show a strong relationship between communities' and drug distributors' perceptions of LF's causes and their perceived risk of contracting the disease. Participants who

cited spiritual factors, for example, believe that they are susceptible to the disease because, for them, they are ignorant of who has the intention to harm them or not. It is quite challenging for these participants to stay safe from LF if you do not know where it will come from.

> *"From my mind, that is what I said, I take the drugs, but if something happens somewhere, you can get it. If someone puts a hand somewhere, they know how he will do, and you will get it without knowing."* ***CM_Female_Trader_54_Zampe***

Whereas, for participants who cited Lezard, wall gecko, insects, unclean water, and road charms as the causal factors, they are safe from the disease. The reasons were that firstly they could boil the water that will kill all the germs inside before drinking. Secondly, they can avoid stepping on a lizard or the tail of the wall geckos. Thirdly, some said to be very old to roam in the community and step on charms. An illustration of this is as follow:

> *"Me? Myself? No! What will make me get it? Right now, my system is weak, and so I do not roam. Elephantiasis sometimes is caused when you step on some local herbs while walking".* ***CM_Male_No Occupation_60_Mankuma***

Another interesting aspect revealed by this study's results concerns urban dwellers' perception of LF as a rural disease. Some participants felt that LF is a rural disease, i.e., they are only found in rural areas, and therefore, they cannot be exposed to the risk of being infected. They explained that LF's vector is an insect living along riverbanks that they believe are not found in the city.

> *"...No, because I know that those who live closer to the riverside, they are susceptible but here, where I'm staying, is far from the riverside, so, I don't believe I'm susceptible ... I said this because I think that they are not in the town. But the villages probably they can be there but not in the city...Hahahaa I am in town if I leave and go to the village, probably"* ***CM_Male_Teacher_35_Zampe***

4.3 Drug Distributors 'knowledge regarding LF

As with community members, the same knowledge about the disease, i.e., its attribution to its single clinical manifestations, was also noted among drug distributors. Most of the participants identified the disease by swollen legs or scrotum, and they further stated that LF was synonymous with Elephantiasis. A participant expressing himself in this sense said:

> *"Eiii, when you see that person, you will notice that the legs are swollen, and when the legs are swollen, you will know that the person is suffering from that disease."* ***CDD_Female_Housewife_50_Mankuma***

However, one of the interviewed participants confided that the disease is not detectable in the early stages of infection. Only the apparent symptoms can tell communities that it is Elephantiasis, which they considered to be the same as LF.

> *"hmm, when it's at the early stages, you can't know until it begins to show and no one will tell you it's elephantiasis, you yourself will know"* ***CDD_Male_Farmer_35_Mankuma***

4.3.1 Knowledge of the causes of LF

On the causes of the disease, some of the distributors' responses matched what the communities had previously mentioned in attributing the origin of LF to animals such as snakes and elephants and food such as salt in this specific context. However, none of the distributors attributed the disease to spiritual forces or magico-religious context.

For some, the disease results from a snake bite, while for others, it is the bite of an elephant or contact with its feces that results in the condition.

> *"I think it is caused when someone steps on feces of an elephant because it looks like that of an elephant leg or if it's a bite from an elephant... it mostly affects the leg making the leg look like that of an elephant as well, that's why even it is called Elephantiasis because it resembles that of an elephant.."* ***CDD_Female_Student_25_Mandari***

Salt abuse, especially uncooked salt, has also been implicated in the transmission of LF. As one participant noted: *"Eeii for this disease, I won't lie, but some people always say it is as a result of taking in too much salt, and so if one is found of taking in too much salt, he can get it..."* ***CDD_Female_Housewife_50_Mankuma***

In addition, LF was considered contagious too by some distributors who stated that the contagiousness of the disease is one reason for isolating people with the condition and their discrimination within societies. The fear of being contaminated by the sick leads LF patients to isolate wherever they cannot mingle with healthy people.

> *"So, once you get the disease, you are being isolated in your own room and everything to prevent the transmission."* ***CDD_Female_Student_25_Mandari***

However, few drug distributors clearly stated that the disease is transmitted through mosquito bites from a sick person to a healthy one. According to them, this knowledge was conveyed during the training days for the MDA program that they have accumulated.

> *"When we were first called to go and distribute the drugs, we were told that mosquitoes cause the disease... someone can get infected with the disease if that mosquito should bite me and goes to bite another, he/she will get infected as well".* ***CDD_Male_Farmer_35_Mankuma***

4.3.2 Drugs Distributors'Knowledge regarding LF prevention

Many of the distributors cited MDAs as a prevention strategy against the disease through annual drug distribution. They argued that MDAs are designed and implemented to prevent communities from getting the disease and that continuous intake of the drugs would ultimately help eradicate the condition in the affected districts.

> *"Yes, we can prevent the disease because we now have drugs for it, of which we go round to give the drugs. Once people keep on taking the drugs, eventually, the disease will be eradicated."* ***CDD_Female_Student_25_Mandari***

However, it was also highlighted by some participants that reducing excessive salt consumption, avoiding being bitten by a snake, and preventing contact with elephant feces are ways of preventing people from getting the disease. One expressed himself in these terms:

> *"Yes, by god's grace, it can be prevented, that is by telling them not to take too much salt, not taking too much salt ohh... and even if you want to take food with salt, you should make sure that the salt is cooked, and even if salt is not enough, don't try adding any salt".* ***CDD_Female_Housewife_50_Mankuma***

4.3.3 Perceived severity and susceptibility

All participants considered LF to be a severe and dangerous disease and shared their fears of contracting it for various reasons. For some, the lack of treatment for the disease, which most often leads to the death of the affected person, would explain their perceptions of the disease's severity. In contrast, for others, the disabling nature associated with the social stigmatization of patients justified their views. Participants explained that LF patients lose the use of their limbs, forsake their income-generating activities, and end up becoming a burden on their families and the wider community. In these participants' views, they are rejected by the city, which diminishes any contact that puts them at risk. Excerpts from the participants' responses to the severity of the disease are presented below:

> *"Yes, it is because I heard people use to die from it in the olden days, and the stigmatization of it as well can lead to death."* ***CDD_Female_Student_25_Mandari***

> *"Yes, it is severe because if you have it, you can't go to the farm, you can't travel, you can't do anything without the support of anyone. You become a burden to the society".* ***CDD_Male_Farmer_32_Zampe***

However, despite the disease's perceived severity and danger by most distributors, many considered themselves not susceptible to the disease. For some, the fact that the elephant and insects they cited as LF's cause did not exist in their localities would explain their non-

susceptibility to the disease. For others, it was the ability to control their intake of the salt they claimed to use in moderation that kept them safe from the disease.

> *"Eiji, because I know that I don't take too much salt and I don't take uncooked salt, so am sure that I can't acquire the disease"* ***CDD_Female_Housewife_50_Mankuma***

> *"No, I think I cannot get the disease because once has been transmitted through elephants, it becomes difficult for me to get it because there are no elephants in this area"* ***CD_Female_Student_25_Mandari***

For other distributors, it was rather the antihelmintic drugs that they said they have taken during all distribution campaigns that explain their non-susceptibility to the disease thanks to its preventive properties. One distributor shared this information during an interview: *"I take the drugs, so I am sure I can't get it.* ***I:*** *Why do you say so?* ***R:*** *Because I take yearly whenever they come around."* ***CDD_Male_38_Farmer_Mandari***

Very few distributors said that they were at risk of contracting LF, which does not know religion, age, or social status. Anyone living in endemic areas can contract the disease.

> *"... It doesn't come with your status or your religion or your age group in society. I remember when we were going around doing the distribution of the drug we had of a case of hydrocele, a child less than ten years having hydrocele, everyone can get this one (LF), I am sure"* ***CDD_Male_Student_19_Bole***

4.4 Perception of the Mass Drug Administration Program

Regarding community perceptions of the MDA for the LF program, the findings will be organized into four sections: community knowledge of the MDA program and their positive and negative perceptions.

4.4.1 Communities' knowledge regarding MDA

The study findings showed a general awareness of the MDA program for LF by all participants who overwhelmingly felt that the drug distribution campaigns are annual and are aimed at preventing the disease.

> *"It is because of the disease that they give us. They tell us that we should take the drug to prevent the disease from getting us, that is why they bring them to give us".* **CM_Female_Trader_54**

Moreover, most participants were familiar with the drug distribution strategy. During the interviews, they repeatedly mentioned using a stick to determine each individual's drug dosage according to his or her height. The bar is a unique sign or symbol of the LF drug distribution campaigns. It is mainly sufficient to alert the community that has become too familiar with the frequently implemented program. A drug distributor said in this regard:

> *"The drug is usually giving to us every year. They measure you and give it to you according to your height. Every year, they come to distribute the drugs ..."* **CM_Female_Farmer_32_Kapurepe**

A distributor speaking on the question mentioned: *"...I think each area I go to; I find some people saying, ooh, is that the Elephantiasis drug? Is that this?...the moment they just see the pole, they are aware that that is the Oncho or elephantiasis drug because it is like something they regularly give, okay to give the medication, so people are aware of it."* **CDD_Male_Student_19_Kapurepe**

4.4.2 Positive perception of MDA

MDA's purpose and drug effectiveness: Many participants had a positive perception of MDA's activity. They generally expressed confidence that the purpose of MDAs was beneficial to both individuals and communities. The benefits mentioned were related to the effectiveness of the drugs distributed, which, on the one hand, helps to prevent the disease as this participant stated: *"We appreciate it because it helps us because it prevents the sickness."*

CM_Female_Trader_25_Kapurepe and on the other hand, help rehabilitate LF patients as described by this woman: *"To prevent us from getting it (the disease) and also to cure those who have the disease. If one is developing the disease it helps fight it".* ***CM_Female_ Housewife _70_Kapurepe***

As a result of this positive perception, these participants expressed favorable views towards drug uptake and the determination of how many drugs to take. They declared that they have always taken the drugs and reiterated their willingness to continue to do so. The strategy for height measurement is also well appreciated because, according to them, health providers are in the best position to determine how to do this.

> *"As for me if they bring it always, I will take, I don't know of others. If they think it is okay, they give it every six months or yearly; it fine with me provided it will help me."* ***CM_Female_Housewife _70_Kapurepe***

A drug distributor expressing how some people appreciated the drugs' effectiveness said: *"When we were sharing it, some people approached me and said the drugs are perfect and even requested for more and I said no..."* ***CDD_Male_Farmer_32_Zampe***

MDA Awareness: Concerning the dissemination of information on MDAs, some participants reported always having information on the organization of campaigns in record time. The information shared is generally the campaign program where it is precisely the start and end date, the exhortation of the communities to take the drugs to prevent themselves from the disease, and resort to the Health Centre in case of side effects.

> *"They tell us the day and date they will give the drugs. You should be around to take the drugs. And when you notice any side efforts, you should report immediately".* ***CM_Male_No Occupation_60_Mankuma***

> *"They usually give more than a week; they will provide the information three times on the radio before they come. They give it today, give tomorrow, and give the next day just to remind us."*

CM_Male_Trader_30_Mankuma

Information is disseminated using either mass media such as radio, or traditional forms of information such as religious centers (Mosque and Church) and public announcers (Gon Gon beating). Health providers are cited by community members and drug distributors as the primary sources of information and sometimes religious leaders. *"When they want to give the drugs, the hospital workers go to inform the mosque and radio for them to announce. And the day they are coming too is also announced."* ***CDD_ Male_ Student_ 19_Bole***

However, most of the nurses interviewed cited community drug distributors as the primary source of information. According to them, since volunteers are close to the communities, they are better positioned to pass on information to local leaders and organizations.

> *"It's the volunteers who will go round and also inform the people that this is what is going to happen and since that's not the first time of taking it... So the communication is that we inform the volunteers and the volunteers will intend to inform the people...So It's the volunteer who will also inform the chief of the ongoing exercise."* ***CN_Male_45_Mankuma***

4.4.3 The negative perception of MDA

Unlike those who have a positive appreciation of the program, negative opinions on aspects such as the purpose, dissemination of information, and the implementation of the program were raised by participants.

Firstly, skepticism regarding the aim of the MDA was observed. Some distributors shared their lived experiences with individuals who ascribed the purpose of MDAs to family planning purposes instituted by the Ghanaian government. They argued that many people believe that the government came up with the MDA program to introduce drugs to make women infertile and control their galloping demography. In this regard, there is the testimony of this distributor who said:

"We have complaints like that, the government of Ghana sees that we are too many, so they want to reduce the population so that it is a family planning contraceptive that they are intentionally giving us as lymphatic filariasis drug that is what they tell us sometimes." ***CDD_Male_Student_19_Bole***

Then, several perceptions of the drug emerged from participants, with some believing that the drugs kill if combined with alcohol, as the following participant mentioned: *"I heard two people took the drug, drunk alcohol and they die ...".* ***CM_Male_No occupation_60_Mankuna*** and others believing that they are produced by white people to give African illnesses or worsen their state of health. In that same logic, it was reported that some perceived the dug as the cause of lymphatic filariasis and explained that people get infected, or the disease only manifests after taking the drugs.

"So, there are some people that when you go to their houses to give them the drug, they will tell you that ooh my aunty or my sister once took this drug she did not have Elephantiasis ... and after she took the drug, she started getting Elephantiasis..." ***CM_Male_Trader_30_Mankuma***

In addition, exploring community perceptions of MDA awareness raised a variety of complaints. These difficulties included the lack of information on the program and the delay in disseminating this information. Several participants indicated that the program's implementation often catches them off guard because they do not receive any prior knowledge about the campaign or receive it late, as stated in this extract:

"We are usually not informed before they come. You are in your house, and suddenly, they come home to give the drugs. They do not inform us before. They just come and tell us they are giving drugs for Elephantiasis." ***CM_Female_Farmer_32_ Kapurepe***

Moreover, the communication problem was seen by some participants as a lack of consideration towards them; they did not feel respected by the implementers. According to them, this lack of

respect can be explained by the fact that they are health agents and thus feel superior to the communities.

"No, this is because they don't respect us because they are health workers, they don't respect us, that's why they can just at any time make an announcement and start given the drugs the next day, they do not consider us, that is why..." ***CM_Female_Trader_54_Zampe***

Nurses talking on the issue acknowledged the facts. They affirmed that this constraint is due to a lack of funding to cover a long period of communication and information and sometimes to the hierarchical authority (Ghana Health Service), which in some instances, imposes schedules without taking into account the realities on the ground.

"Mostly, it is supposed to be a week to the program, but sometimes Ghana Health Service does its program like the military command. Sometimes we will just be there, and they will just say "Oncho" is coming, or it's not only "Oncho," most of the programs are like that. You will just be there, and they will say this "do this and do that" and sometimes when it's like that mobilization is always a big challenge." ***CN_Male_45_Mankuma***

Finally, there were complaints about not following the distribution guidelines such as measuring height before determining the number of medications to be taken and also the adherence to the DOT strategy, which is the Directly Observed Therapy. Some participants stated that the distributors, who generally have participated in the past campaigns, think they know everyone's height; that is why they leave the drugs for those who are absent with those in the households. For others, the reason is just that they do not want to go back into the same home.

"Also, when you bring the drugs, you should ensure to see if we all have taken it. Before you leave the place, but mostly, they do not follow it, they will give you if you are at home will say your dad is at this height, your mum too to leave the drugs with you. For me, it is not like that, what they do, but we do not talk." ***CM_Female_Trader_25_Kapurepe***

4.5 Drug's uptake

Drug distributors gave the same account as community members concerning community members' drug uptake. It was found that though some cited the drug uptake, several participants indicated never having taken the drugs or not intending to take them at all in the future. *"When I came, in this house they have given twice. When they came, I said I do not even want them... the drugs I have never taken them before. I have collected them, but I have not taken them... for me, I will not take them..."* ***CM_Male_Trader_30_Mankuma***

For others, although they said that they used to collect the drugs from the distributors during the campaigns, they specified that the decision of drinking them or throwing them away is their own choice. A Participant said: *"If you say that you are coming to give me the drugs, I don't have anything to tell you, either I will take it, or I will take it and throw away. Is that not so? Hahaha (laughing). If I do not want it, I will collect it and throw it away...."* ***CM_Male_No occupation_60_Mankuma***

Participants mentioned some community members' reluctance to take the drugs regardless of who is involved or what they are told. A distributor testifying to the refusal to accept the drugs told one of his experiences in these terms:

"Me, I Entered a household of about seven people before I could ever remove the drugs I was asked to go and, that, they won't drink and I went away I wrote on the book refused, refused, refused... and went away" ***CDD_Male_Farmer_35_Mankuma***

4.6 The barriers to the acceptability of the mass drug administration for LF

The barrier to the acceptability of MDAs for LF was classified into three parts based on the collected data. These are personal barriers, socio-cultural barriers, and health system barriers,

4.6.1 Personal barriers

4.6.1.1 Alcohol consumption and pregnancy

The drug distributor and nurses commonly raised alcohol as an essential factor preventing some people from taking the medication. They confided that many people are attached to alcohol or are even drunks and cannot stay a moment during the day without drinking. Later, participants mentioned that these people are informed about the program but do not stop drinking, regardless of the distributors' arrival time.

> *"You know the drug to is having the dos and don'ts. Let us assume you are not supposed to take alcohol before taking the drug, and you go and meet a drunkard or someone who takes alcohol all the time. So that particular person this is a barrier to him because of the alcohol he will not at all forgo the alcohol and take the drug (Laugh)"* ***CN_Male_31_Mandare***

Moreover, it has been reported that this factor added to pregnancy serves as a false pretext for people who do not want to take the drugs to escape the distributors. Some claim to be under the influence of alcohol, and others claim to be pregnant even if they are not. The following statement illustrates this idea: *"Some also say they are pregnant because they don't want to take the drugs or the pregnant one state, it terminated their pregnancy so that they won't take next time."* ***CM_Female_Trader_40_Zampe***

4.6.1.2 Not being sick or at risk of getting LF

Some participants mentioned not feeling the need to take the drug since they are not sick:

> *"Maybe it is because they don't have the sickness"* ***CM_Female_ Housewife _70_Kapurepe*** or they are not at risk of getting the disease *"Hihi, they believe that they can't get infected by the disease..."* ***CM_Female_Housewife_55_Zampe.***

All categories of participants shared this opinion. One community nurse shared his experience on the subject: *"You know human beings; I think it will take us a lot of time. With the preventive*

measures, people feel that I don't see the need to take drugs..." ...Some people think I am not sick, why should I take the drug, can you see?". ***CN_Female_42_Zampe***

4.6.1.3 Lack of confidence in the drug's effectiveness

The communities' lack of confidence in the drugs was also a barrier to the program's acceptability. Some participants stated that they do not see the importance of the medications since there is no discernible difference between those who take the drugs and those who do not. A few participants stated that they do not see the importance of medication as there is no palpable difference between those who take the drug and those who do not. They testified that some people have lived for years and years in endemic areas with no medication and are still in good health.

> *"For me, as I said earlier, I can't remember the last time I took the drug. So I cannot say that the drug works because those that have taken the drug have not developed the condition, and I who have not taken the drug have not also developed it. So I cannot say the drug is effective; I can say that the drug is effective if a portion of the people who didn't take the drug develop the condition".* ***CM_Male_Teacher_35_Zampe***

In Addition, the products' perception as being responsible for some people's illnesses and death has also been cited as a factor preventing compliance with the program.

> *"Some are like they don't take it, this is the same drug that gives this person this disease, and he is now suffering from this disease, and he is dead sometimes they said he is dead..."* ***CDD_Male_Farmer_32_Fampe***

This lack of trust was also considered a result of low community awareness of LF and a barrier to MDA's compliance. In this regard, some participants felt that they would not take them if they know nothing about the illness or the drugs.

"I am not a doctor, I cannot also know how they should give medicine. If I don't know anything about a drug and you give it to me, I will collect and throw it away... "

CM_Male_Trader_30_Mankuma

4.6.2 Population mobility

Population movements from one setting to the other were identified as limiting drug uptake by some social groups. Several nurses and drug distributors reported constant absenteeism of particular categories of people due to their social activities such as farming and animal rearing. The Fulani community, which is known for its seasonal sedentary lifestyle due to cattle breeding and farmers looking for suitable land for their activity, was cited by participants to illustrate this phenomenon. An informant said: *"...because of the farming, you settle here when the land is becoming poor, or people are disturbing you, you migrate to another land so that you may go to a place, and the next time they are not there, they have moved to another area to go and farm... A good example is the Fulani people. They migrate a lot due to their cattle raring..."* ***CN_Male_49_Bole***

4.6.3 The Month of Ramadan among Muslims

Another barrier raised by the Participant was Ramadan's month, during which the Muslim community fasts every day. They reported that distribution campaigns often fall in this specific month, during which the concerned communities decline to take medication because of their religious practice. Even if some people express the resolution to pick the medicine and take it after breaking their fast, participants stressed that forgetfulness might prevent them from doing so. This view is described below:

"...When we are fasting, and they come, we tell them we are fasting. Some people might pick it so that they take it later, but may forget to take it..." ***CM_Female_Trader_25_Kapurepe***

"...We have this Islamic thing, Emm, during the distribution, most of them, especially if it fall in the fasting season, it is difficult I won't even say is the Muslims, but usually is the Muslims own

that is recognized in our society because it occurs in a particular month of the year"

CN_Female_42_Zampe

"We didn't meet our target; even getting 50% was a problem because it was a fasting season. Those we met take the drugs and as to whether the taken drug is another problem"

CDD_Female_Student_25_Mandari

4.6.4 Socio-structural barriers

Patriarchy: Some participants also mentioned the influence of family authority on the decision to take the medication or not. Wives or children are forbidden to take the drugs by the father, even though they want it. It was specified that even with the local authorities' intervention that is usually involved in managing such cases, the father remains on his decision without giving any reason.

"...There was an instance when we went to some community, a father said he would not take it, and he said because he will not take it, he won't allow the family members also to take. So, we were saying, if you will not take, allow your wife and children to take, and the man said no..."

CN_Female_42_Zampe

4.6.5 Health System barriers

4.6.5.1 Drugs' side effect

One of the key barriers that emerged from the data was the drugs' side effects. Most participants emphasized the fear of experiencing side effects that individuals have experienced once or have been observed with others, resulting in a fear that leads to outright refusal of medication. Despite the explanations given by the distributors or nurses on the question or the free medical care offered by the health centers, some people firmly hold on to their position, as this drug distributor explains:

"Some will tell you they ever took the drug and become ill so that they won't take it. They will not even listen to you at all; they will say some took it last year and were hospitalized, so they will not take it. They will never understand what you tell them." ***CDD_Male_Farmer_32_Zampe***

Participants cited drugs' reactions such as itching, dizziness, body pains, swelling of limbs such as feet, scrotum as in the following quote from a distributor: *"It is not everybody in the community that agrees to this program, and this is because some complaint of adverse effects following the drug intake..., such as; body itches, body pains, dizziness, and so on."* ***CDD_Female_Housewife_50_Mankuma***

4.6.5.2 Ineffective health communication on MDA and LF

Lack of knowledge and information about LF and MDAs was raised by many participants to prevent them from taking the drugs. Some felt that they did not have enough information about the distributed drugs and therefore refused to take them. Others described the information they received as inadequate and not sufficient to enable them to accept the drugs.

"The other problem is, they don't tell us what the drug will do to you, but they only tell us what not to eat when they give it to you. They said they don't drink when taking it, and I think that is one of the reasons why I didn't take mine... the information is not adequate as I said they give the announcement, but it is not adequate..." ***CM_Male_Teacher_35_Zampe.***

For others, it is the lack of information about the drug distribution program that prevents them from taking the medication as this participant said:

"We are usually are not inform before they come...that is why some used to throw the drugs away because they were not pre-informed." ***CM_Female_Trader_54_Zampe.***

One nurse also said: *"Sometimes once the education is not also done properly, that brings the problem of some of them not willing to take the drugs."* ***CN_Male_31_Mandare***

4.6.5.3 Insufficient time allotted to MDAs and inadequate timing

The other factor that emerged from the study as a barrier to drug intake is the drug distribution

period's unsuitability to the community's main activity, agriculture. A distributor said to this effect: *"Heuhh the timing it's also a problem when it's the farming season and you bask someone to go and give the drugs especially in the villages by the time you go they will be in the farm, those you will go and meet you won't hit your target."* ***CDD_Male_Farmer_35_Mankuma***

Similarly, the lack of time allotted to distribution contributes to the shortcomings noted, as explained by this participant: *"I think the number of days used in administering the drug I want to say that probably it is a short duration, that is what I can say because sometimes by the time you hear that they are administering they had left your community"* ***CM_Male_Teacher_35_Zampe***

4.6.5.4 The low motivation for CDDs

It was found that drug distributors' motivation has a significant influence on the quality of their work, which has a considerable impact on the acceptability of the program by the community. Both distributors and nurses mentioned that lack of motivation prevents some distributors from doing their job correctly, such as convincing the city to take medicine or making the program stand out. This factor was raised as a de-motivation source for many distributors who have given up during the campaigns.

> *"Because of the low allowances, some of the volunteers sometimes intentionally give excuses and dodge the program, so we look for people to go and work in those communities... but when the motivation or allowance is high, they will work efficiently and will encourage them (people) to take the drugs".* ***CN_Male_49_Bole***

The neglect of LF compared to other diseases such as malaria, which participants claimed to be considered more critical than the LF by the government, was raised by all the nurses met as being at the root of the low motivations of CDDs.

> *"That is why I am saying this one is a neglected tropical disease; the government doesn't pay more attention to it. Government upon government has not paid much attention to it... much attention has not been given to it, and enough funds are not released."* ***CN_Female_42_Zampe***

4.7 Facilitators to the acceptability of the program

4.7.1 Community leaders' involvement

Local leaders and champions' engagement and participation in implementing the MDA were found to be very helpful for the program's acceptability. Many participants acknowledged the notoriety and legitimacy of local authorities (traditional and religious…). They mentioned their support and contribution that is very beneficial, especially in cases of refusal that are often observed or if there are groups of people who want to attack the distributors whom they often accuse of being responsible for the side effects of the drugs. Nurses and distributors claimed to use them during all distributions, informing them of the program and sometimes requesting them to take the drugs in public to serve as an example.

"…When it happens, usually we have also to go and tell our top supervisors, then they will go to the community and go and see the chief, then tell him what has happened and is from this household, then the chief will send for that person… if someone doesn't want to take it, you involve the chiefs or the leaders in the community, and they will help you to convince him…" ***CN_Female_42_Zampe***

4.7.2 Distributors' commitment to give their time and effort for the benefit of their communities.

The effort provided by the distributors was also cited as factors facilitating the acceptance of MDAs. It was explained that despite the poor working conditions for drug distribution in the context of LF, such as low motivation, lack of necessary logistics, and inaccessibility of some areas, the distributors give their time and effort for the welfare of their communities. The nurses even mentioned that without their availability and willingness, it would be challenging to implement MDAs in such a context. They go around in households, sensitize people, use the leaders to make people accept the drugs.

"It is the volunteers sacrifice, even though they are not well-motivated, but they care a lot about their community, they want to help them, that is why they will go round, in remote areas to distribute the drug even though you do not give them fuel…, they think that it's their community so if they neglect them…" ***CN_Male_Nurse_45_Mankuma***

CHAPTER FIVE

5 DISCUSSION

5.1 Community members and drugs distributors 'knowledge of lymphatic filariasis

This study was undertaken to explore factors associated with the acceptability of the Mass Drug Administration for lymphatic filariasis among communities in the Bole District. The key findings are discussed in this section based on the specific objectives of the study.

Knowledge of LF has an essential influence on the MDA program's acceptability by communities, as reported by Krentel et al. (2013). The results of this study showed insufficient knowledge of LF among communities and drug distributors. Many Participants did not know that an LF patient could be asymptomatic in the early stages of infection. Their knowledge of LF was based only on its obvious chronic symptoms (hydrocoele and elephantiasis), which are apparent in the later stage of the disease. Similar findings have been reported in studies conducted in Ghana and Kenya, where LF was considered synonymous with elephantiasis, described by participants as the swollen leg, breast, arms, and scrotums (Biritwum et al., 2017) (Kisoka et al., 2016b). These same studies also highlighted how people's knowledge of LF affects their decision to accept or reject MDAs. This fact suggests the importance and needs to educate people about LF by making them understand that an infected person can be asymptomatic and that the symptoms of the disease may appear years after being infected.

Knowledge of the disease has moreover fostered community perceptions of its severity. The reasons attributed to LF severity based on the study's findings were more related to its debilitating and disabling effects leading to loss of income generation, social segregation, and exclusion of the patient as raised in a study conducted in the Philippines (Amarillo et al., (2008). In addition, a lack of familiarity with the causes and modes of transmission of the disease was observed. Various misconceptions among the Participants were raised, ranging

from attributing the illness to supernatural forces (witchcraft, curses.), eating habits, animal origins, or its consideration as a hereditary and contagious disease. For instance, the present study revealed that Participants believe that the LF is caused by consuming a lot of salt, bush meat, and can be through witchcraft and even curses. These findings are consistent with those of Wynd et al.'s (2007) study, conducted in Papua New Guinea where it was reported that hydrocoele was considered to be the result of a curse suffered by a person for stealing from a betelnut plantation.

Misconceptions surrounding the disease and its causes have shaped communities' perceptions of risk. Many Participants in this study felt that they were not at risk of having the disease because either the disease vectors that they sometimes considered to be elephants and lizards either did not exist in their localities or they were able to control their food. A similar relationship between causes and the perceived risk was found by Krentel et al. (2013), where some study Participants cited the ability to control mosquitoes as a reason for not being susceptible to LF. Only a few distributors were aware that mosquitoes transmit the disease from a sick person to a healthy person. A further important element was, as shown by Kisoka et al. (2016), the perception of LF as a rural disease (i.e., a condition that exists only in rural areas), translating into a non-risk perception among city dwellers. Such considerations are barriers to the acceptability of MDAs and, again, raised the need to implement effective community education on LF.

The disease has also been considered severe, owing to the incurability and pains inflicted by the infection. These reasons were mentioned to express the need and importance to prevent LF from Participants who considered the disease to be preventative, although the mentioned methods which were divergent and sometimes inadequate. For example, some participants felt that reducing the amount of salt eaten or boiling unclean water before drinking would prevent LF. Others said that taking the drugs during the MDA campaigns, keeping the living

environment clean, or using mosquito nets would help prevent LF. Such misconceptions about preventive measures concerning participants' understanding of the causes of the disease have been reported in a study conducted in Kenya (Kusi et al., 2020).

All the factors described above demonstrate an insufficient knowledge of the disease among community members and distributors in general and suggest a need for adequate LF education to increase the acceptability of MDAs. Several studies have shown that understanding the disease, its etiology, implications, and prevention methods are essential factors in accepting the MDAs (Shuford et al., 2016; Hussain et al., 2014b).

5.2 Perception of the Mass Drug Administration Program

In this study, all Participants were informed and familiar with the implementation of MDAs, which they said has been going on for a couple of years now. However, their opinion on the program's purpose and the drugs being distributed varied considerably.

Positive appreciation of the distribution strategy such as free drugs, home distribution, and the preventive and curative effect of the medicines distributed was mentioned. This result is consistent with the findings of Ahorlu et al. (2018) and Kisoka et al. (2016), which reveals that Participants who had a good appreciation of the program were going to the local health centers to request the drugs if they were absent from their homes during the delivery. The results also demonstrated how disseminating information on MDAs was considered a crucial element in the program's acceptability, as was the case in the Cantey et al. (2010) study. The information received on the program was considered sufficient and disseminated in time by some, which in most cases, allowed them to prepare accordingly for the distribution. Health workers were the primary sources of information cited by Participants using radio and religious places (Mosques & Churches) as the primary means of communication. Biritwum et al. (2017), in a study conducted in Ghana, reported how raising awareness through mass media and other

communication strategies was relevant for successful implementation and acceptability of MDA.

However, although the results showed a positive perception by some participants, doubts about the program's purpose, some associated with a family planning program introduced by the government, and misconceptions about drugs were noted. Furthermore, some community members felt that they were not respected by distributors who came into their house to play the chief and give orders. Others even felt that not being informed about the distribution was disrespectful to them. This is consistent with Ahorlu et al.'s (2018) study findings on community perspectives on the persistent transmission of lymphatic filariasis. In this study, community leaders emphasized that the distributors pretended to be professional doctors or behaved as if they were doing the community a favor by distributing the drugs. This result shows that the relationship between the distributor and the populations is determinant for the acceptance of the intervention, as reported in the study on How lymphatic filariasis was eliminated in Dominican Republic (Gonzales et al., 2019).

Other dissatisfaction expressed by the participants was the non-adherence to the distribution guideline such as DOT by the distributors or the failure to take measurements of the absent persons before determining the dosage of the drug to be left. This factor was even raised by Shuford et al. (2016) in their study as a reason for non-compliance with the program. This indicates the need of monitoring distributors to ensure that people are taking the drugs and thereby improve trust between them and communities who felt that the distributors are only trying to fill out the records given to them to demonstrate the quality of their work without looking at who took or did not take the drugs.

5.3 The barriers and facilitators to the acceptability of the mass drug administration for LF

The results reported in this study showed that all members of the community do not accept MDAs. On the question of whether they had ever taken the drugs or intended to take them, three trends emerged: those who said they had taken the drug, those who said they had never taken them, and those who said they had stopped taking them or even thrown them away from the distributors. These decisions around non-acceptance of the drugs were related to the following aspects:

Drugs' effect: participants cited side effects resulting from taking the medication as reasons for refusal. This was also one of the most prominent reasons in this study where complaints of fatigue, dizziness, swollen leg and scrotum, rashes, vomiting were identified as associated with MDAs. A similar trend has been detected as hindering factors to the acceptability of the program by communities (Gonzales et al., 2019). Moreover, in a systematic study conducted on Compliance with anthelmintic treatment in the NTD control programs, side effects were considered one of the dominant reasons for LF and onchocerciasis using the combinations of albendazole, diethylcarbamazine, and/or ivermectin (Shuford et al., 2016).

On a personal level: on the one hand, there was a lack of risk perception and the non-recognition of the drugs' benefits. This is not a new factor since similar observations were made in the studies of Hussain et al. (2014). On the other hand, there was alcohol consumption, which is a contraindication of drugs, which also proved to be a constraint for this category of people. The same finding was made in a study conducted in Ghana, where distributors considered this fact a main factor of non-compliance during MDA camping (Biritwum et al., 2017). Another significant element reported in this study report was distrust of the government and the purpose of the program. Participants, as the study conducted by Kusi et al. (2020), stated that they believe that MDA is a family planning program established by the Government to reduce the

population's birth rate. Optimizing information and discussion sessions with communities on the importance of MDAs, their purpose, the potential side effects of the drugs distributed, and the availability of free care for the cases must be discussed and shared with them to ensure a better understanding. Moreover, in India, it was shown how information sessions organized prior to implementing the 2008 MDA increased the number of adherence to treatment (Cantey et al., 2010).

Health system barriers: the non-suitability of the distribution periods that usually fall during the rainy seasons when people are busy with farming and the constant mobility of specific categories of people were reported as affecting the acceptance of MDAs as indicated in the study of (Njomo et al., 2012) or the systematic review of Krentel et al. (2013). However, though the unsuitability is reported to be more related to community activities such as farming, this study's results indicate that distribution campaigns were implemented during the month of Ramadan, leading Muslims to decline the drugs due to their religious fasting practice. Added to this is the non-adherence to the DOT (Directly Observed Therapy) strategy, as reported in a study as a significant factor in non-compliance (Manyeh et al., 2018). Participants explained this fact in this study due to insufficient time allocated to MDAs, inadequate number of CDDs to cover all the areas concerned within a limited distribution period, and low incentives given to distributors (Njomo et al., 2014).

People were also not willing to accept the medication because of the lack of knowledge and awareness of MDA and LF, as showed by a study conducted in Tanzania where both community members and drugs distributors were found to be lacking knowledge on the disease and the MDA (Kisoka et al., 2016a). Lack of awareness on MDA has been identified as the primary reason for non-consumption of the drug in studies (Gyapong, Owusu, da-Costa Vroom, et al., 2018) and (Njomo et al., 2014). The lack of knowledge of the disease, its causes, and consequences as well as the lack of knowledge of MDA's purpose, its importance, and the side

effects of the drugs distributed are some examples given by the participants to illustrate this opinion. Educating, sensitizing, and mobilizing communities through multi-channel communication approaches with key messages on LF and MDA should be advocated for better adherence to the program as suggested by (Manyeh et al., 2018) in Ghana.

Socio-structural barrier: The patriarchal influence is also noted as a limit to the acceptability of the program. Situations, where heads of families refused to allow their wives and children to take the drugs even though they were willing to take them, were shared. As in the systematic study conducted by Krentel in 2013 and the Ohurlu study conducted in 2018, the structural barriers imposed by family power and the relationship between decision-making power in accepting MDAs were raised.

As a facilitating factor for implementation, the local leaders' involvement such as traditional leaders, religious leaders, etc., was one of the most common points raised by participants in this study. Their involvement and contribution were based on managing refusal cases or problems resulting from the appearance of side effects in the populations. The practical contribution of these traditional figures in the successful implementation of MDAs was reported in a study conducted in the Dominican Republic, where community leaders were responsible for coordinating and supervising the distribution teams (Gonzales et al., 2019). The other aspect was the distributors' willingness to give their time and effort for the common good of their communities. This is in line with the same study conducted in the Dominican Republic, where the willingness of people to volunteer was a facilitating factor in eliminating LF in an Urban district (Gonzales et al., 2019).

5.4 Study limitation

The main limitation of this study was the language barrier encountered during data collection and transcription. Not understanding the local language of the study area because the principal investigator was an international student, she had to rely on a local translator in the field to get

an idea of the information collected daily. This situation limited her ability to verify the quality of the data produced. The same limitation was observed during the transcription of the data. However, after the quality check, which was based on comparing the length of the interviews and the number of Word pages produced, and the logic in the flow of ideas, the investigator, realized that the work was poorly done. After many attempts at correcting the data with the first team of transcribers, no success was achieved. Four teams of transcribers and checkers were used for one month in total for the data transcription, but almost the same remarks were made with a few slight improvements. Being limited by the time frame for the thesis submission, the PI, in consultation with the study supervisor, decided to proceed with the data analysis as enough information was already available, and time was limited.

CHAPTER SIX

6 CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Acceptability of the Mass Drug Administration for lymphatic filariasis by communities require a combined effort from different actors and stakeholders.

Knowledge of LF, particularly its definition, causes, modes of prevention, and perceptions of risk to a great extent was not known by community members who were interviewed in this study, including the distributors. Many of them attributed LF only to its chronic manifestations, others linked its causes to supernatural forces, and perceived themselves as not susceptible to the condition. However, although a significant number of participants had a good opinion of the MDAs and the distributed drugs, some had negative views about its purpose, information sharing way, and distribution strategy. However, it is essential to note that despite the divergent views on MDAs, the program was perceived as a good preventative measure against the disease.

Reasons for not accepting MDAs were more related to program-related factors, which are nonetheless modifiable than the population's perceptions and practices. Many factors were identified as being barriers to the acceptability of the program. Significant among these were: side effects of drugs, poor knowledge of the disease, lack of information on MDAs, non-suitability of MDAs timing to population programs, insufficient distributors and time allocated for implementation, and lack of trust in the government.

Local leaders' involvement and the willingness and commitment of drug distributors to serve their communities were the major points that emerged from the study as facilitating the intervention's acceptability.

To address the observed shortcoming to the MDA's acceptability, the Program Implementers (Health authorities at all levels) must prioritize education and awareness on LF and MDA seriously and community involvement and mobilization. Communities' knowledge of LF and awareness of MDA and its benefits should be improved through intensified and practical health education and promotion activities.

6.2 Recommendations

In this section, recommendations for effective implementation of the MDA program for the LF to improve its acceptability by the communities is presented. These recommendations are based on the main findings of this study. Hence, for better acceptability of the MDA program by the communities, it will be important to take into consideration the following recommendations:

6.2.1 To the Ghana Neglected Tropical Disease Program

1- There is a need to advocate at the National Government to consider the LF as a public health priority for diseases such as malaria, and therefore, to take concrete actions to improve the program's implementation. In this regard, sufficient funds should be made available to cover the costs of education and information campaigns on LF and MDA and increase incentives for distributors.

2- The calendar for the implementation of the MDA for LF needs to be adapted to the communities' availability and their socio-religious events, such as the month of Ramadan and the farming season.

3- Allocate sufficient time for the organization (information and campaigns) and recruit enough CDDs to implement the MDAs in all areas.

6.2.2 To the Health Districts

1- Develop and implement community-based education programs on LF. These programs should be designed to provide the community with a general knowledge of the disease, such as its

causes, implications, and prevention methods. However, it would be essential to involve communities in defining training strategies and implementing these programs.

2- Promote early information and sensitization sessions on the implementation of MDA programs on the effectiveness of distributed drugs, especially on free care availability to manage adverse events.

3- Involve communities and community leaders as critical stakeholders in the program implementation process to build confidence and facilitate ownership of the program.

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Appendix 1

Study title: "Acceptability of the Mass Drug Administration for lymphatic filariasis among community members in Bole District, Savanah Region, Ghana."

INFORMATION SHEET

Introduction

My name is Habibata Baldé (Principal Investigator). I am a master's student from the Social and Behavioral Science (SOBS) Department at the School of Public Health, University of Ghana, Legon.

Information on the study

This present study aims to explore factors associated with the acceptability of the Mass Drug Administration for lymphatic filariasis among community members in the Bole District. More specifically, we want to find out the community members' knowledge about LF, their perceptions of MDA, and what are, according to them, the barriers and facilitators to the program's acceptability.

The information to be collected will help understand factors associated with the program's acceptability and then inform future interventions for its better acceptability.

Procedure and duration

As part of the study, we are conducting in-depth-interview (IDIs) and focus group discussions (FGDs) with community members, community mass drug distributors, nurse, and lymphatic filariasis program officers on understanding how MDA campaigns are organized and what barriers are encountered in the implementation process. The interview and discussions will take about 60 to 120 minutes of your time, respectively, at most and will be audio-recorded. Note, you have the right to accept or not the audio recording if you are not comfortable with it.

Potential Risks

There is no risk in participating in this study.

Potential Benefits

There is no direct benefit to you for participating in this research. However, the information you provide may generate new knowledge about the study topic and guide future interventions in the field for better acceptability.

Confidentiality

Any information you share with us during this interview will be confidential and used for the purpose of this study. Access to the data would be limited only to the research team, and no identifying information will appear on the transcripts or the study reports.

Compensation

There will be no compensation for participating in this interview. However, the researchers will reimburse participants' transportation costs where appropriate.

Voluntary Agreement

Your participation in this study is voluntary. Therefore, you have the right to choose whether or not to participate. If you agree to participate, you can withdraw from the interviews at any time without expecting a penalty and having to give a reason.

Provision of Information and Consent for participants.

A copy of the information sheet and consent forms will be given to you after it has been signed or thumb printed.

Who to Contact for Further Clarification/Questions

If you have questions or worries concerning the study, please feel free to contact these people:

- **Habibata Baldé**, Principal investigator
  Tel: 0503537289, **Email:** habicompanya@gmail.com

- **Dr. Emanuel Asampong,** Supervisor of the study
  Email: asampong2000@yahoo.com

Appendix 2

Study title: "Acceptability of the Mass Drug Administration for lymphatic filariasis among community members in Bole District, Savanah Region, Ghana."

INFORMED CONSENT

Participant ID: _____ /__/__/

Introduction

My name is ....., and I am a researcher from the School of Public Health. We are conducting a study to explore factors associated with the acceptability of the Mass Drug Administration for lymphatic filariasis. Particularly, we are going to find out what are the community members' knowledge about LF, what are their perceptions of the MDA program, and what is, according to them, the barriers and facilitators to the acceptability of the MDA among the community.

The information to be collected will help understand the program's acceptability and then inform future interventions for better acceptability.

Procedure and duration

For this study, we are conducting in-depth interviews with community members. The discussion will take about 40 to 60 minutes of your time and will be audio-recorded and later transcribed into English for analysis. Note that you have the right to accept or not accept the audio recording if you are not comfortable with it. But be assured that no personal information will appear in any transcripts of the discussion.

Potential Risks

There is no risk in participating in this study.

Potential Benefits

There is no direct benefit to you for participating in this research. However, the information you provide may generate new knowledge about the study topic and guide future interventions in the field for better acceptability.

Confidentiality

Any information you share with us during this interview will be confidential and used for this study. Access to the data would be limited only to the research team, and no identifying information will appear on the transcripts or the study reports.

Compensation

There will be no compensation for participating in this interview. However, the researchers will reimburse participants' transportation costs where appropriate.

Voluntary Agreement

- I understood the study's purpose and asked all my questions that have been answered to my satisfaction.
- I am aware that even if I agree to participate, I can withdraw at any time of the interview or refuse to answer any question without any consequences.
- I understand that I will not benefit directly from participating in this research.
- I understand that all the information I provide for this study will be treated confidentially.
- I am aware that my identity will not appear in any report on this research results; my identity will remain anonymous.
- I voluntarily consent to participate in this interview
- I agree to my interview being audio-recorded

Name and phone contact of the researcher for additional information: Habibata Baldé, ***Tel:*** 0503537289, ***Email:*** habicompanya@gmail.com

Name and Signature of the Participant **Date**

.....

Name and Signature of the Witness ***(if applicable)*** **Date**

.....

Researcher

"I believe that the participant has willingly given his/her informed consent to participate in this study and has the legal capacity to give consent."

Name and Signature of the Researcher **Date**

.....

Appendix 3

"Acceptability of the Mass Drug Administration for lymphatic filariasis among community members in Bole District, Savanah Region, Ghana."

INTERVIEW GUIDE WITH COMMUNITY MEMBERS

Date ___/___/___/ Sub-District_____ Participant ID /__/___/

Introduction:

1- Introduce yourself, present the purpose of the study

2- obtain informed consent from the participant.

3- Ensure that the recorder is working properly and are in a quiet environment before starting.

BACKGROUND INFORMATION:

Sex_____ Age_____ Education Level_____

Marital status_____ Religion_____ Occupation_____

I- COMMUNITY KNOWLEDGE AND PERCEPTIONS ABOUT LYMPHATIC FILARIASIS

1- What do you know about lymphatic filariasis?

What does it mean for them? How do they recognize the disease? Symptom)

2- What is according to you the causes of lymphatic filariasis ***(what transmit the disease)?*** How would you explain its mode of transmission of LF?

3- Do you think that you are susceptible to get lymphatic filariasis? ***(Probe why)***

4- Do you think that Lymphatic filariasis is a severe or dangerous disease?

5- Do you think that the disease can be prevented? ***(if yes, how, and if not, why?)***

6- Where do people affected by lymphatic filariasis go to seek care?

II- COMMUNITY' PERCEPTIONS ABOUT MASS DRUG ADMINISTRATION (MDA)

7- Are you informed about any drug administration program? *(where the heights of people are measured and tablets are given?* What do you know about the program? What is the purpose of the program?

8- How are you accustomed to being informed about distribution campaigns? Were the strategies used appropriately?

- *Media as television, radio, home visit, community meetings*
- *How early are you informed about the campaigns, and how often?*

9- From whom are you used to receive the information?

- *health workers, community' leaders, mass drug distributors, friends, or family ...*

10- **What kind of information do you receive during MDA campaigns? Probe**

- *whether about the disease, the MDA's objectives, the importance of the drugs, the side effects related to the drugs, how to manage these effects....*

11- What is your opinion on this information? Do you believe it? Do you think they are sufficient to enable communities to understand the importance of treatment and accept the program?

How do you appreciate the drugs distributed during MDA?

(probe on the Assumption that free medicine will not work)?

12- What is your opinion on the organization of drug distribution?

- How is it organized, is the strategies good and the implementation time appropriate?
- How do you interact with the drug distribution agents during the campaigns?
- How do you appreciate your level of involvement? *(is it enough, is there something more to add according to you?)*
- What is the nature of your relationship? Do you know them?

III-BARRIERS AND FACILITATORS TO THE ACCEPTABILITY OF THE MDA PROGRAM

13- In your opinion, did everyone in the community accept the MDA program? If not continue

14-What do you think are the reasons why people don't accept the program?

- Are there any socio-cultural factors associated with this non-acceptance?

15- What do you think are the facilitators of MDA's implementation?

16- In your opinion, what should be done to make the program more acceptable?

Probe: in terms of communication or information, community involvement, MDA organization,).

Conclusion

- Do you have something to add?

- Do you have any questions for us?

- If you have questions, please feel free to contact us at this number: **0503537289**

Thank you for your time and cooperation

"Acceptability of the Mass Drug Administration for lymphatic filariasis among community members in Bole District, Savanah Region, Ghana."

INTERVIEW GUIDE WITH NURSE

Date ___/___/___/ Sub-District_____ FGD ID /__/___/

Introduction:

1- Introduce yourself; present the purpose of the study

2- obtain informed consent from the participant.

3- Ensure that the recorder is working properly and are in a quiet environment before starting.

BACKGROUND INFORMATION:

Sex_____ Age_____ Religion _____

Education level_____ Position_____

ORGANIZATION OF MASS DRUG ADMINISTRATION FOR LF (MDA)

1- How do drug distributors select for the mass drug administration program? Is the community consulted in this selection?

2- How is the communication process on MDAs established? How early is the community informed, and by whom?

3- What are your main roles in MDA campaigns?

4- How do you collaborate with the drug distributors during the MDA?

5- What is the nature of the collaboration you have with the community during MDA campaigns? Is the community involved? What is their role?

6- How do you appreciate their level of involvement? *(is it enough, is there something more to add according to you?)*

7- Do you think that the communities receive all the necessary information to accept the MDA program? Do you think that their needs are taken into account in these campaigns? If so, how?

8- How do you appreciate community members' knowledge of LF and MDA?

(Probe: *Do they know what the disease is? Do they consider it as severe? Do they know about MDA campaigns and its importance?).*

9- Where do people affected by lymphatic filariasis go to seek care? ***(why this choice?)***

10- What are the main complaints that you receive from the community regarding MDAs?

11- What are the main challenges you encounter during the distribution?

How do you

BARRIERS AND FACILITATORS TO THE ACCEPTABILITY OF THE MDA PROGRAM

12- Did everyone in the community accept the MDA program? If not continue

13-What do you think are the reasons why people don't accept the program?

- Are there any socio-cultural factors associated with this non-acceptance (religion, believes)?
- Could it be a lack of knowledge about the disease or the importance of MDA?
- Is it related to the way the program is implemented? The timing of implementation, population mobility, the interaction between CDD and community, etc.?
- Is it related to the fear of side effects from the drugs?
- Could some people feel that they do not have the disease or are not at risk of getting it?

14- What do you think are the facilitators of MDA's implementation?

15- In your opinion, what should be done to make the program more acceptable?

Probe: in terms of information, MDA organization…).

Conclusion

- Do you have something to add?

- Do you have questions for us?

- If you have questions, please feel free to contact us at this number: **0503537289**

"Acceptability of the Mass Drug Administration for lymphatic filariasis among community members in Bole District, Savanah Region, Ghana."

INTERVIEW GUIDE WITH COMMUNITY DRUGS DISTRIBUTORS

Date ___/___/___/ Sub-District_____ IDI / FGD ID /__/___/

Introduction:

1- Introduce yourself; present the purpose of the study

2- obtain informed consent from the participant.

3- Ensure that the recorder is working properly and you are in a quiet environment before starting.

BACKGROUND INFORMATION:

Sex_____ Age_____ Education Level_____

Marital status_____ Religion_____ Occupation_____

CDDs' KNOWLEDGE AND PERCEPTIONS ABOUT LYMPHATIC FILARIASIS

1- What do you know about lymphatic filariasis? (*What does it mean for them? How do they recognize the disease? Symptom).*

2- What is, according to you, the causes of lymphatic filariasis? How is it transmitted?

3- Do you think that you are susceptible to get lymphatic filariasis? ***(Probe why)***

4- Do you think that Lymphatic filariasis is a severe or dangerous disease?

5- Do you think that the disease can be prevented? ***(if yes, how, and if not, why?)***

6- Where do people affected by lymphatic filariasis go to seek care? ***(Why this choice?)***

ORGANIZATION OF MASS DRUG ADMINISTRATION FOR LF (MDA)

7- How are you identified and selected to participate in these campaigns as distributors? Is the community involved in this selection?

8- What are your main roles in MDA campaigns?

9- Do you receive training before the implementation? How early are you informed about an impending MDA? Please tell us how these training are organized, what modules are developed

10- How do you appreciate the time allocated to these training and the modules developed? Are they sufficient, and do they meet your needs for the implementation of the program?

11- Do you think that the communities receive all the necessary information to accept the MDA program? Do you think that their needs are respected in these campaigns? If so, how?

12- How do you appreciate the relationship you have with the communities during the campaigns? Do people feel concerned or involved in the program?

How do you appreciate their level of involvement? *(is it enough, is there something more to add according to you?)*

13- What are the main complaints that you receive from the populations regarding MDAs?

14- What are the main challenges you encounter during the distribution?

BARRIERS AND FACILITATORS TO THE ACCEPTABILITY OF THE MDA PROGRAM

15- Did everyone in the community accept the MDA program? If not continue

16-What do you think are the reasons why people don't accept the program?

- Are there any socio-cultural factors associated with this non-acceptance (religion, believes)?
- Could it be a lack of knowledge about the disease or the importance of MDA?
- Is it related to the way the program is implemented? The timing of implementation, population mobility, the interaction between CDD and community, etc.?
- Is it related to the fear of side effects from the drugs?

- Could some people feel that they do not have the disease or are not at risk of getting it?

What do you think are the facilitators to MDA's implementation?

17- In your opinion, what should be done to make the program more acceptable?

Probe: in terms of information, MDA organization…).

Conclusion

- Do you have something to add?

- Do you have questions for us?

- If you have questions, please feel free to contact us at this number: **0503537289**