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FACTORS ASSOCIATED WITH HOME VISIT ON MALARIA PREVALENCE IN CHILDREN UNDER AGE FIVE IN KIBI IN THE EAST AKIM MUNICIPALITY OF GHANA

BY

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DECLARATION

I Mohammed Mutala Abilena declare that this work is the result of my own effort, and it has not been submitted either in part or whole for any other degree with the exception of specific references which have been duly acknowledged.

SIGNATURE…… DATE ……

MOHAMMED MUTALA ABILENA

(STUDENT)

SIGNATURE……. DATE ……

PROF. AUGUSTINE ANKOMAH

(SUPERVISOR)

DEDICATION

To my parents, Mr. and Mrs Mohammed Ali and to my wife, Mrs. Ernestina Mensah, children Abilena Kada Itidal and Abilena Asagpare Nabil.

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ABSTRACT

Background: Home visit is a strategy used to reach out to members of a household for discussion and provision of health services by Community Health Officers. This approach is mostly used in deprived communities to provide health services at the doorstep of community members. Not much is known about this strategy in the public health sector. From the review of literature, malaria forms a significant proportion of diseases in most of the Out-Patient Departments. There are also a significant proportions of interventions which are ongoing to curb this trend in Kibi, therefore studying one of the components of the intervention is of much importance in advocating for the usefulness of home visit in a bid to prevent malaria in children under five years.

Methodology: A cross sectional study design was used for the research. A stratified random sampling was also used in the selection of homes for the interview**.** The population of interest were children under five years. Total sample size of 300 was used for the study and a structured questionnaire was used to collect data from caregivers. Homes which were selected and not visited by Community Health Officers were selected for the study.

Results: Absence of malaria as reported by caregivers for children under five was 50.7%. Proportion of homes visited by Community Health Officers was 35.8%. For homes that were visited 57 (19.0%) were visited once in a month while 82(27.3%) lasted for more than 30 minutes. Homes visited was significant in reporting absence of malaria in children under five. Fever was identified as the cardinal sign of malaria for most caregivers 195(65.0%) while bites of an infective female anopheles mosquito was identified by a majority (74.6%) of caregivers as the mode of malaria transmission. Most (60.3) children slept under an LLIN the previous night and this was significant in reporting absence of malaria in children. Majority of caregivers with malaria visited the hospital (77.1%) and 14.9% provided home based therapy for management of malaria.

Conclusion: The research findings showed that homes visited by Community Health Officers had a significant association with reported absence of malaria. Therefore, for effective prevention of malaria, home visit should be encouraged while focusing on LLIN use for children under five years.

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LIST OF ACRONYMS

ANC	Antenatal Care
AOR	Adjusted Odds Ratio
CHAG	Christian Health Association of Ghana
CHO	Community Health Officer
CHPS	Community-Based Health Planning and services
CHW	Community Health Worker
CI	Confidence Interval
COR	Crude Odds Ratio
CT	Artemisinin Based Combination Therapy
EBF	Exclusive Breastfeeding
HRH	Human Recourses for Health
IEC	Information Education and Communication
IMNCI	Integrated Management of Neonatal and Childhood illnesses
IPTc	Intermittent Preventive Treatment for Children
ITNs	Insecticide Treated Bed Nets
KAP	Knowledge Attitude and Practices
LLINs	Long Lasting Insecticidal Bed Nets
LMIC	Low Middle Income Countries
MCE	Municipal Chief Executive
MCH	Maternal and Child Health
MDG	Millennium Development Goals
MDHS	Municipal Director of Health Services
MHD	Municipal Health Directorate
MTN	Mobile Telecommunication Network
PPE	Personal Protective Equipment
RDHS	Regional Director of Health Services
RDTS	Rapid Diagnostic Test Kits
RHM	Rural Health Motivators
SDG	Sustainable Development Goals
TBA	Traditional Birth Attendants
WIFA	Women in Fertility Age Group

KEY TERMS

Home Visit serves as a tool to reach out to members of a community to assist in health delivery, thus a visit made by a health care provider to the home of the client in helping to resolve challenges related to health of a client and the community in general.

Malaria is an infectious disease which is caused by protozoan parasites from mostly the plasmodium family that is transmitted through the bite of an infected female anopheles mosquito or by a contaminated needle or transfusion. Plasmodium falciparum is the most common malaria causing protozoa in Ghana which can be very fatal if not treated in time.

Children Under five according to the Ghana Health Service are children aged between zero to fifty-nine months and are a very important group for public health interventions.

Caregiver is an individual who takes care of the child under five by ensuring the child is well feed, needs are provided for, proper health seeking behavior for the child health and ensuring the child is healthy

Community Health Officers (CHO) are health professionals mostly nurses in East Akim who have received training in CHPS implementation and are stationed at a community to provide health based intervention for members of the community. The initiative shows a key strategy for providing health care (primary health care) to the doorstep of community members. Members are in their home and a health worker visits them to provide basic health services such as health education, provision of family planning and ensuring improved health status for members of the home.

CHAPTER ONE

1.0 Introduction

Globally, children are more vulnerable in contracting malaria. They account for more than two thirds of global malaria deaths. However, malaria mortality has generally declined. From the WHO 2016 report, malaria mortality rates declined by 62% globally between 2000 and 2015, and by 29% between 2010 and 2015. Malaria frequently occurs in Africa because it is endemic in the continent. Ghana is part of Africa where malaria is habitually present. Children and pregnant women are the most vulnerable group of individuals who suffer from the malaria related infections. This specific group of individuals are important in public health due to their reduced immunity. Hence the need to provide improved intervention to mitigate the impact of malaria burden in the municipality. The Democratic Republic of Congo and Nigeria account for over 40% of the estimated total malaria deaths in 2012. (Singh, Musa, Singh, & Ebere, 2014).

In the year 2000, 99% of maternal and child mortality occurred in low and middle income countries. (Lawn, Cousens, & Zupan, 2005) This significant proportion of mortality occurs among the vulnerable groups in the population. Within the Africa continent, a shortage of human resources for health and over concentration of health professionals in the Urban centers had consistently reduce the proportion of staff at the rural areas which currently affects the delivery of health in the rural areas. The shortage of critical health professionals can also be attributed to constraints in attaining the Millennium Development Goals (MDGs) 4 and 5. However, the MDGs are now situated in the Sustainable Development Goals (SDGs). (Gilmore & Mcauliffe, 2013).

Home visit involves the right preparation before embarking on the exercise, ensuring the right kits and logistics are available. Educational materials, health assessment tools and

timing were essential in during home visits. The home visit programme includes, addressing health issues not in isolation but instead concentrate on the promotion of positive health-related behavior for the family with emphasis on vulnerable groups such as children under five and pregnant women. In addition to providing social support, meeting broad-base family needs were important in home visit. This programme focuses on the quality of parent–child interaction which were important to caregivers in adequately caring for children. (Sar, Antle, Bledsoe, Barbee, & Van Zyl, 2010)

In West Africa, a study in Ghana by Ahorlu et al in 2009 showed that 76.4% of caregivers in rural areas of Keta and Akwapim North districts from 2002 to 2004 knew that mosquitoes transmits malaria. The 76.4% of caregivers with knowledge on causes of malaria was high yet malaria continues to be among the top ten diseases in most health facilities in the country with children under five and pregnant women been most affected. (Ahorlu, Koram, Seakey, & Weiss, 2009). Malaria is a critical health issue which continues to drain the resources of developing countries. Many resources including human and financial are continually pumped into the control of malaria which can equally be directed to other important sectors of the economy.

Additionally, Community Health Officers were engaged in delivering health based support to community members in both developing and developed world. They were an essential component in reducing maternal and child related mortality, in spite of these immerse contributions to the delivery of health, evidence are rarely available on their effectiveness for certain type of programs more importantly programs related to prevention of malaria and other diseases. Currently a lot more programmes related to malaria prevention were taking place in East Akim Municipality. These includes; distribution of Long Lasting Insecticidal Nets (LLINs) to school pupils, point distribution of LLINs to households, children attending child welfare clinics for measles two vaccination and pregnant women

attending antenatal Clinics (first ANC registrants) were all issued with Long Lasting Insecticidal nets to reduce the prevalence of malaria in the Municipality.

1.1 Problem Statement

According to Dodoo et al.(2009) malaria the world over is estimated to cause 300 to 500 million clinical cases with about 700,000 to 1.6 million deaths every year. This is significantly greater compared to other diseases in the world. About 94% of these deaths are believed to occur in sub-Sahara Africa. Malaria remains a major cause of morbidity and mortality in Ghana, accounting for over 40% of outpatient clinic visits and about 20% of deaths in children under five in 2004. (Ahorlu et al., 2009).

During the 2015 annual review of East Akim Municipal Health Directorate, the total malaria cases recorded for the period under review stood at 43237 as against 41237 in the year 2014. The proportion of under 5 malaria cases stood at 32% in the year 2015 against 34% in the year 2014. East Akim Municipal Health Directorate, 2015 (unpublished data). Moreover, children under five years are more vulnerable in the population due to their fragile immune system. Vulnerability becomes greater during the first 1000 days of the child's life.

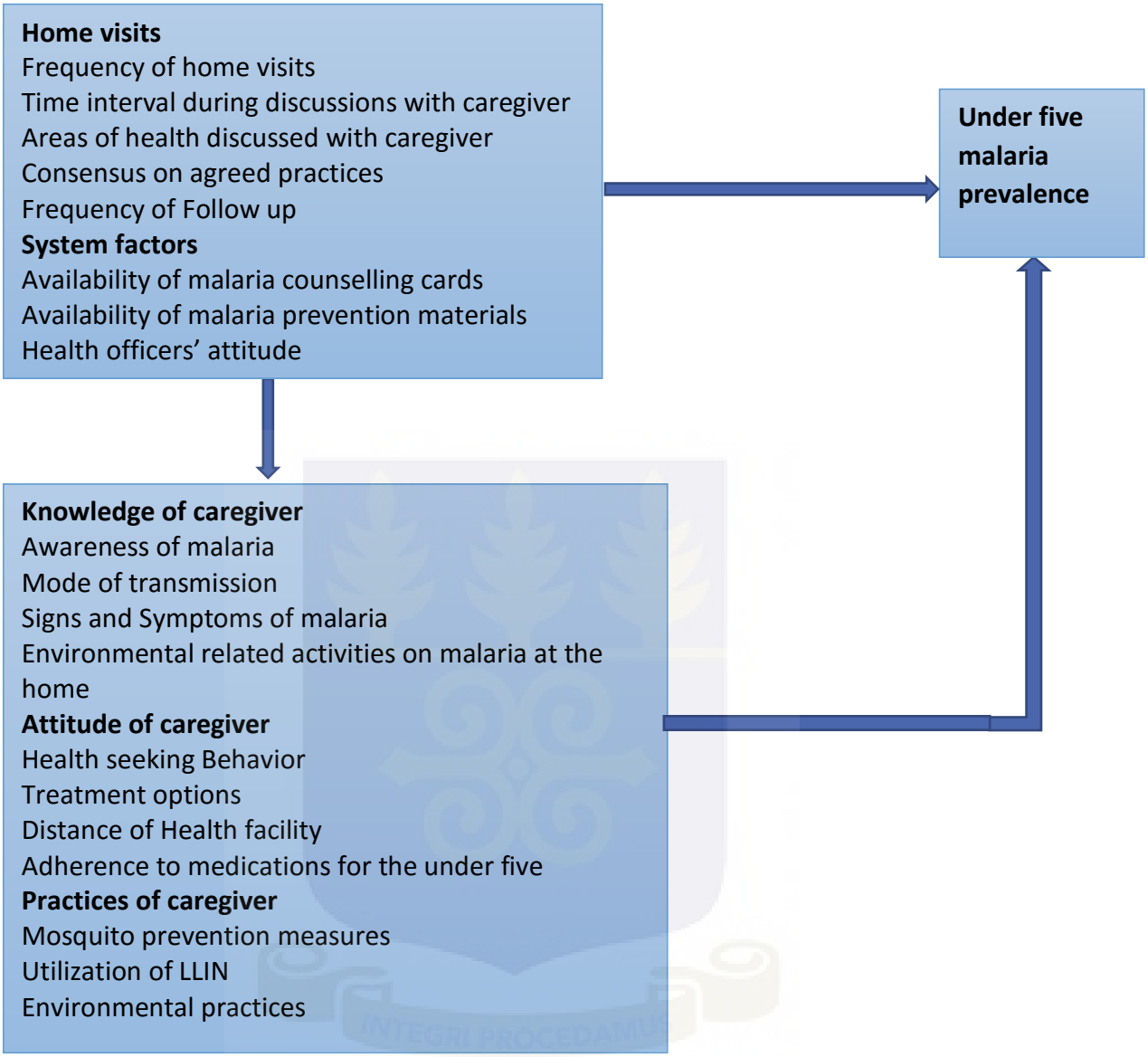
The use of home visit has long been advocated for as a means to improve preventive child health services, particularly in less endowed communities of developing countries. The contribution of home visit was rare in Ghana and in East Akim. Recently it has been suggested by policy makers that this type of visit should give particular attention to the parent-child relationship, as well as advice on child related problems. If this type of home visit, was to be made a priority in maternal-child health programmes, then researching into its efficacy was appropriate in improving health status of children under five years. Also, contributing factors at the individual level such as educational status of caregiver, care seeking behaviors and sources of information, alongside other factors such as; malaria

transmission route, signs and symptoms of malaria, availability of long lasting Insecticidal nets, prevention and control of malaria are essential factors which were explored to understand the concept of the home visit module.

The factors which influence home visit activities were; frequency of homes visited, period of visitation, follow up on agreed practices and duration of visit at the home of caregivers. These were critical in assessing home visit component of the CHPS programme which affects health of children.

The research is essential in assessing factors related to home visit which influence self-reported malaria in children under five. The caregiver has a direct influence on the health of a child under age five. Moreover, home visits are essential component of the CHPS strategy, but it is unknown how home visits help prevent malaria in Kibi in the East Akim Municipality of the Eastern Region.

Conceptual Framework



1.2 Narrative of Conceptual Framework

Home visit forms an important intervention for primary health care delivery in rural communities. The conceptual framework depicts the theory of step by step factors influencing under five malaria prevalence in the Kibi Municipality of the Eastern Region of Ghana.

Home visit was the primary independent variable. The outcome variable for the conceptual framework was malaria morbidity for children under five years. Home visit influences under five malaria prevalence. Visit conducted by a Community Health Officer at the home of the caregiver, encourages the caregiver to freely articulate her concerns to the health professional who in turns assist the caregiver in her concerns hence contributing to improve health status of children under five years. The CHO easily assists the caregiver to make informed choices for improvement of health in relation to the child.

Frequency of home visit, timing of visit, time interval during the discussion, discussion areas of health with the caregiver, consensus on agreed practices and frequency of follow up turn to influence the caregiver and thus affect malaria prevalence of children under five years of age. These factors were known to affect the health status of children under the age of five years in Kibi.

Caregivers' knowledge on preventing malaria which includes; covering water storage containers, destroying used cans and other environmental related activities affect the breeding sites of mosquitoes at home promoting the bites of mosquitoes' hence affecting malaria prevalence of children under five years.

The attitude of caregivers' in areas such as health seeking behavior, treatment option (whether to visit the clinic, provide home based therapy or use herbal medications), the distance of the health facility and adherence to medications prescribed for the child under five also affects malaria prevalence of children either negatively or positively. Were medications taken adequately and at recommended times, these were important as it influenced the severity of malaria at the individual level.

Practices of caregivers in the home affects malaria prevalence for children under five years, these practices include utilization of Long Lasting Insecticidal nets, destroying used cans

and other breeding areas of mosquitoes influenced malaria prevalence in children under five years.

When these attitudes and practices are improved, it reduces the malaria prevalence in children under five years.

1.3 Justification

The findings from the research on the home visit programme in influencing under five malaria prevalence is expected to provide policy makers at the national, regional, district and other relevant agencies information on how to improve activities of Community Health Officers in reducing the burden of malaria that threaten the survival of children in Kibi.

Reporting on a detailed information of practices about caregivers, their knowledge, attitude and practices which turn to influence the health of children would provide evidence on the need to shape and adopt strategies conducted by health workers. This would help health professionals to be equipped with knowledge in other to help reduce the burden of malaria in Kibi.

Results from the research is expected to provide information for health workers conducting home visits to understand the importance of discussions with caregivers, frequency of home visit, need for follow up visits and areas for improvement in relation to malaria prevalence in children. These are important for the country to ensure reduction of malaria in children younger than five years.

1.4 Objectives

1.4.1 General Objective

To assess the influence of home visits by Community Health Officers on under five self-reported malaria in Kibi

1.4.2 Specific Objectives

1. To measure the frequency of home visits to caregivers of children under five by CHOs
2. To assess the knowledge, attitude and practices of caregivers who had either received visits or not from Community Health Officers in relation to malaria
3. To assess malaria treatment options and household reported symptoms of malaria for homes visited and not visited by CHOs

1.5 Research question

How does home visit by Community Health Officers influence self- reported malaria in children younger than five years?

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter explored literature and academic works conducted in Ghana, Africa and the World in general. The existed gaps were identified, how the various studies were conducted and findings presented were also discussed in this chapter.

2.2 Home Visitation

Home visit is important in addressing public health issues in the community where resources are not adequate. According to Gilmore & Mcauliffe (2013), not much progress have been made by developing countries in reducing maternal mortality by 75% and under five deaths by two thirds. These were the targets which were respectively set by the United Nation for the Millennium Development Goals 5 and 4 respectively. Rwanda as a country, have been able to achieve 75% reduction in maternal mortality. In 2010 alone 287,000 women and 7.6 million children under-5 died as a result of complications in pregnancy and poor health system delivery in the developing world. Even though there are available evidence based on cost effective methods that could have prevented more than a quarter of maternal and child health complications and deaths. More than 50% of children living in deprived countries do not still have access to these important interventions. These interventions have been identified as key characteristics of initiating primary health services for developing countries. With regards to the Alma- Ata Declaration of 1978, Community Health Officers were recognized as key Human Resource for Health (HRH) by providing essential Maternal and Child Health services at the door step of community members mostly in rural areas of developing countries. Embarking on educational activities with curative services have been

paramount and also provides essential role for collaboration between community and the more trained health professionals.

The essential group in the provision of this important service to the community were the Community Health Officers who had the details of the pregnant women and their children under five years. Timely service are rendered to these vulnerable groups. The CHOs are found in the community at designated health facilities called the Community-Based Health Planning and Services which was located in the community.

The home visit programme serves as a tool to reach out to members of the community to assist in health delivery. The Community –Based Health Planning and Services Programme employs home visit as a key method in addressing primary health care in the communities. Health is brought to the people at their door steps without visiting the clinic. The mother feels comfortable in addressing any health related concern to the Community Health Officer than at the health facility.

According to Gilmore & Mcauliffe (2013), a comprehensive study examined CHO activities around the world and found that these staff were influential in the reduction of maternal, neonatal as well as child mortality in countries with very poor health services. Moreover, findings on the effectiveness of various activities was recognized as lacking, these were mainly findings from the preventive section. This made the study of assessing outcome of CHO services in the CHPS setting necessary to assist in future planning and resource allocation to low level staff at health facilities in the country. In understanding the viability of CHOs activities in providing curative services for children in sub-Saharan Africa further presented huge mortality declines for malaria, and indicated the essence for detailed research into the appropriateness of Community Health Worker activities.

Ahorlu and other investigators conducted a pre and post study in the perennial malaria endemic Volta Region of Ghana. Community Health Officers were task in delivering Intermittent Preventive Treatment for Children (IPTc) 6 to 60 months every four months, for 12 months. The 357 children after 12 months post intervention, revealed that malaria parasite prevalence had reduced from 25.0% to 3%. Rates of anaemia also experienced a reduction from 26.6% at the initial stage to 16.8% at end phase, and use of LLIN appreciated from 38.5% to 60%.(Ahorlu et al., 2009). This finding sought to imply the various roles these cadres of staff played in improving the health status of community members. Visits by CHOs was accompanied by improvement in health and behaviour change communication in the community. However, comparing the sample size of the Ahorlu et al study to other literature, the sample size was not adequate for the study.

Furthermore, Okeibunor et al. (2011), utilized a pre and post parallel group design for evaluating the extent to which societal based interventions can be used to mitigate malaria in pregnancy. Community Health Officers issued two doses of sulphadoxine-pyrimethamine for Intermittent Preventive Treatment in Pregnancy (IPTp) and LLIN, together with basic counseling services. An additional 7.4% of women in the intervention group (n=751) utilized an LLIN while pregnant, and an additional 8.5% slept under an LLIN postnatal. The experimental group also had significant higher rates of taking a minimum of two doses of SP, with the fraction of women rising by 35.5% compared to the experimental group.(Gilmore & Mcauliffe, 2013).

Also, in southwest Uganda, Brenner and colleagues in 2011 conducted a pre and post research to determine the outcome of CHOs in children under age five. Health education accompanying the Integrated Management Childhood Illness now called Integrated Management of Childhood and Neonatal Illnesses (IMNCI) strategy. Post-experimental findings showed a statistically significant decline in diarrhea prevalence of 10.2% and 5.8%

in malaria for the experimental group, this comprised of 606 households. (Brenner et al., 2011)

In other findings by Sheth and Obran in an urban Indian slum provided food safety and health promotion to caregivers of deprived children within 6 and 24 months. This intervention comprised of CHOs conducting home visits with observable counselling cards, to 200 poorer households purposely selected in 8 randomly chosen Anganwai centre. A before and after experimental analysis showed a 52.5% decline in child diarrhea, 65% and 10% decline in caregiver's and children's microbial load. This shows an improvement in hand-washing behavior. In addition to the findings, poor environmental hygiene and mothers poor hygienic practices declined by 36.5% and 8.5%, respectively. (Sheth & Obrah, 2004). The activities undertaken by this cadre of staff referred to as the Community Health Officers provided essential services for the vulnerable groups in the society and brought health services to their door step.

In two peri urban province of South Africa, Paarl and Umlazi, and one rural province, Rietvlei, females in the experimental cluster (n=535) were accorded the same home visit programme as that in Uganda, with five visits within third trimester and week ten. In view of this, the control of peer educators conforming to the same arrangement as that of the experimental group, undertook visits to support caregivers in obtaining birth certificates and governmental support. Differences in breastfeeding rates between experimental and controls were significant for both the 12 weeks and 24 weeks (8%vs. 4% and 2%vs. <1%, respectively), though these were significantly lower than those in the different study area. These and other activities CHOs performed in the community. Home visit was a package of health activities aimed at improving the health of pregnant women and children aged 0-59 months. (Gilmore & Mcauliffe, 2013) The study employed an interventional study design

involving two groups, experimental and control therefore the significant findings brings to light the importance of home visit by CHOs in the communities.

Again in Banfora, a deprived area in southwest Burkina Faso, 392 women were provided seven household visits, first in the third trimester, then second in weeks 1, 2, 4,8,16, 20 for post-partum. Exclusive breastfeeding rates at 12 weeks for experimental and control (n=402) using a 7-day recall were significant at 77% and 23%, respectively. At time 24 weeks, EBF rates were recorded as 71% for the experimental group and 9% for non-experimental. These were improvement which arouse from the home visit activities by CHOs.

Furthermore, a study in Uganda which occurred in rural Mbale District, with 396 women in the experimental group and 369 for controls. Five household visits by community health workers was initiated, one in end stage of pregnancy and one each in weeks 1, 4, 7, 10 for post-partum women. Using 7-day recall, EBF at 12 weeks was statistically higher in the experimental than control, with rates of 77% and 34%, respectively .(Gilmore & Mcauliffe, 2013). Community health Officers were:

1. Capable of providing interventions within and outside their normal scope and with intense training, they can provide lifesaving interventions in the community, such as those of a psychosocial nature or programmed intermittent preventive treatment for malaria. Further research into CHWs providing services for general mental health issues should be supported to provide services for marginalized individuals.

2. Effective in promoting health and educating community members, especially with simple messages easily comprehendible for members of the community. The use of visual aids such counseling cards, posters, community dramas, durbars and more are very helpful in relaying these messages. (Gilmore & Mcauliffe, 2013).

2.3 Knowledge, Attitudes and Practices of caregivers of under five in relation to malaria

The perception of cause of disease was one of the factors that determined option for its cure. Appropriate perception related to cause of malaria determined what the caregiver would do when a child developed malaria. Across Africa caregivers of children had been found to have different understanding of the cause of malaria and how it is transmitted. The farther the distance from the village to the health facility the more likely the care caregiver was to use home treatment for malaria. In a research by Aa et al (2016) in the southern part of Africa, knowledge among caregivers that malaria was actually transmitted by mosquitoes ranged from 92% in Northwestern Tanzania to 70-85% in Ethiopia, Madagascar and Eritrea. In West Africa, a study in Ghana showed that 76.4% of caregivers in a rural area were aware that mosquitoes transmitted malaria. In South Eastern Nigeria, 88.3% believed that malaria is a disease or illness. Other studies in the South West of Nigeria showed in some areas 65% of caregivers were aware that mosquitoes transmitted malaria while in another area only 3.9% of caregivers in a rural area were aware mosquitoes transmitted malaria. The high proportion of correct knowledge of transmission of malaria in this study may be due to the high level of formal education in respondents of this study. These studies were conducted in the Urban settings of the respective country and as stated by the authors as there are most citizen who had being exposed to the different outlets where education on malaria was high but does not translate to change in attitudes and practices by the caregivers of the under 5 year old children. To reduce recall bias, respondents who had treated any child less than five years in the 2 weeks preceding the survey were included among this group, 88% of the respondents gave the correct dose of ACT for the right duration of treatment. Another study showed that there was a significant increase in the administration of antimalarial within 24 hours of onset of symptoms as well as adequacy of artemether-lumefantrine doses obtained

and consumed. In addition, community effectiveness of malaria treatment has been shown to improve after community interventions with treatment within 24 hours increased from 80% to 97%.(Aa et al., 2016)

Continuous individual protection against mosquito bites was often recommended. Use of adequate Personal Protection Materials (PPMs) was defined as the use of a combination of two or more effective measures which includes protective clothing, repellents, mosquito net or insecticides or coils.(Weber, Schlagenhauf, Amsler, & Steffen, 2003). Longer stay of mothers outside the room lead to bites of both mother and the under 5 year olds.

All research participants that had heard about malaria provided appropriate knowledge and attitudes about malaria by indicating that it can result in death if not managed. The participants gave wider sources of malaria information as well as their preference. Health facilities composed of the majority while community durbars were the second most preferred place of obtaining information on health. (Hlongwana, Mabaso, Kunene, Govender, & Maharaj, 2009)

In the Ghanaian settings, there exist traditional ways for which educational activities on health are communicated to members of the community. These channels include: community Information centers, Durbars, church, mosque, and also during home visits by Community Health Workers.

Knowledge (IE&C) on malaria for the households studied, composed of 298 (93.1%) for respondents that had heard about malaria with almost all 99.7% of them associate malaria with mosquito bites. Also, little malaria information came from community meetings. Likewise very little information came from the Health professionals. Symptoms including: headache, high temperature/fever and chills were the three most frequently mentioned signs and symptoms of malaria. Although participants also identified loss of appetite and energy,

dizziness and body pains the numbers were not convincing. Statistical differences were not so much observed for the numbers that identified loss of appetite, dizziness and body pains.(Hlongwana et al., 2009). Also, a small proportion of the respondents included diarrhea and cramps as other signs and symptoms of malaria. (Hlongwana et al., 2009)

In a study by Hlongwana et al in 2009, treatment of malaria in relation to care seeking behavior and prevention indicated that knowledge on malaria treatment was high with 98.1% (n = 320). This was related to use of Artemisicin-Based Combination therapy with primary mention of artesunate amodiaquine. The respondents mentioned that they would seek treatment in health facilities while 1.6% mentioned Rural Health Motivators (RHM). Only one research participant, who doubled as the head of household, mentioned no treatment seeking strategy. This respondent was a 35 year old unemployed female and had no formal education.

Regarding households' promptness in options for malaria treatment 88.1% (n = 320) indicated that they sought treatment within 24 hours of onset of malaria symptoms, with 8.8% who stated a delay of more than two days before going to the Heath facility to seek treatment. For children aged 0-59 months it was important to seek early care and treatment at a recognized facility in or around the community.

Generally, knowledge about malaria prevention options among the participants was high 78% (n = 320), and only a little proportion (14.7%) said malaria cannot be prevented and the remaining 7.3% of the participants did not know whether malaria is preventable. Most respondents knew that health facilities and vector control are important for treating and preventing malaria disease. Another proportion mentioned hygiene, avoidance of stagnant water in the yard, proper disposal of tins; continuous education and a small proportion thought that closed windows could help prevent malaria. The above mentioned sources of

mosquitoes are prevalent in Kibi. Also in Kibi, the activities of the small scale miners' have left stagnant waters in and around major parts of the town, thus serving as major breeding grounds for mosquitoes. This can consequently increase the occurrence of malaria related conditions in the Municipality.

With regards to personal protective measures a few participants indicated that they use bed nets followed by mosquito coils and to a less extent they burned cow dung/leaves. Use of repellent, spray and lotions also constituted a significant proportion for participants while a smaller proportion did not use anything to prevent mosquito bites. (Hlongwana et al., 2009).

The Ghana Health Service in collaboration with Nets works Ghana are engaged in the distribution of Long Lasting Insecticide Bed nets to households in a ratio of one LLIN to two person in the Eastern region and other parts of the country. It is averaged that every household would have at least two bed nets available in their homes.

In the analysis of Hlongwana et al (2009) study in Swaziland showed that most respondents sought treatment in the clinics. Contrary to many sub- Saharan African countries, treatment is sought largely from the private clinics, this difference was associated to improved quality and accessible health facilities in Swaziland compared to other sub-Saharan countries. Ghana stood to be different as there had being improvement in the setting up of CHPS compounds in many places of the country.

Another interesting finding was that more than half (88.1%) of respondents in the research stated that they sought treatment within 24 hours of onset of malaria symptoms. This exceeded the target defined by the Abuja summit on malaria, which stated that, at least 60% of those suffering from malaria should seek treatment within 24 hours of onset. (Hlongwana et al., 2009).

The potential contribution of KAP studies on malaria prevalence and control had not received much attention in majority of Southern African countries. The results showed that most people had information about malaria. The most important source of information was health facilities. There were little information coming from the preferred source such as the tinkhundlas (traditional community district meetings). Similarly, measures provided by the Department of Health generated negligible information on malaria.

Furthermore, Observations regarding preventive measures indicated that majority of respondents (78.1%) believed that malaria was preventable, and stated; clinic, spraying and the long lasting insecticidal nets as key malaria preventive strategies. Despite these positive responses, majority of respondents (43.4%) did not take any personal protective measures to prevent malaria infection. Although KAP related to malaria in the study area was high, it had been shown that as the level of transmission and disease decreased so did the perception on the importance of malaria control activities.(Hlongwana et al., 2009). The failure to consider community's knowledge, attitude, and practice (KAP) about malaria has contributed to the inability of programs to achieve sustainable gains.

Knowledge, attitude and practices of malaria and its control were observed to be low among the study population. This result was in agreement with previous findings of other similar studies. Most respondents reported to have ever heard about malaria. This was consistent with other studies that showed almost all the respondents have heard about malaria. The main source of information was from individuals' experiences with malaria as reported earlier in Nigeria. (Singh et al., 2014)

On the question of, what they would do if their child had fever, a significant proportion of caregivers 137 (68.5%) reported that they would visit the hospital for management of illness. The most important factor was condition of child when deciding to seek formal care for

child with fever, reported by 104 (52.0%) followed by perceived cost by 77 (38.5%) respondent. Attitude regarding the best anti-malarial therapy was limited to chloroquine, reported by most of the respondents. (Singh et al, 2014). According to the Ghana Health Service and the Foods and Drugs Authority the first line medication of choice was artemisinin derivatives. Chloroquine had long been expunged from the medications used in the management of malaria.(Koram, Abuaku, Duah, & Quashie, 2005)

Those who reported using bed nets only, little (31.9%) reported using ITNs and 68.1% of respondents reported using untreated nets. The next most common preventive strategy was use of mosquito coil. This was mentioned by 35% of participants.

This study had demonstrated that respondent had a good knowledge on malaria signs and symptoms. Majority of the respondents stated fever (with shivering) as the most common symptom of malaria and was consistent with findings from related studies. This is consistent with the study of Hlongwana et al study in 2009.

Only a little proportion of respondents correctly mentioned about malaria transmission and its cause. The knowledge level of respondents on mode of transmission was quiet low when compared to findings of previous studies reported across Africa. This may be attributed to low knowledge level. Perhaps solution of malaria control lies in primary care physicians such as family physician or community health workers working in the rural communities.

People's behavior may have increased the risk of malaria, but to alter such behavior was not so possible. Indeed, there were many reasons why particular behaviors existed and they often tied to considerable benefits in areas quite distinct from health. It is often not the case that "these people don't know any better", but rather that their native logic and rationality make sense within the realities and limitations of their local circumstances. (Singh et al., 2014)

Families were the primary context within which most health problems and illnesses occurred and had a huge magnitude of influence on health. Majority of health belief and behavior were developed and maintained within the family. Community perceptions, beliefs, and attitudes about malaria causation, symptom identification, treatment of malaria, and prevention influence strategies to help address malaria and are often overlooked in control efforts. This may vary from community to community and among individual households. (Singh et al., 2014)

Understanding who already knew about malaria and malaria prevention, who had adopted malaria prevention and mosquito avoidance practices, and who was at risk of malaria infection was a necessary precursor to identify and target vulnerable populations and ensure successful implementation and sustainability of malaria control efforts.

Singh et al continued to state that, direct interaction with community played an important role in controlling the spread of malaria. Healthcare providers like family physician act as Community Health Officers and can focus both on traditional physician and patient model. This complement the population based medicine for primary prevention of malaria as domiciliary care and primary prevention are defined characteristics of family medicine. Additionally, this was the actual activities of CHOs in the CHPS setting. (Singh et al., 2014)

To create a synergy between primary care physician and community efforts and government/nongovernmental organized malaria control interventions in northern Nigeria. Understanding the people's knowledge, attitude, and practice on malaria was necessary in planning its control. (Singh et al., 2014)

2.4 Malaria prevalence

In a study by Iwuafor et al (2016), 109 (41.6 %) respondents admitted that at least one child age 0-59 months under the care of a caregiver had malaria related fever 2 weeks before the study; 150 (57.3 %) did not have any child with malaria for the same period as stated previously. This was reported by caregivers. There existed significant association between children aged 0-59 months and presence of malaria. All the 40.1% of children with fever and were tested positive for malaria using the Rapid Diagnostic Test kits while parasitemia were also present using microscopy.

Fever was a cardinal sign of malaria and other acute infections in children. Malaria and other forms of illnesses which caused fever contributed to high levels of malnutrition and mortality in the country. While fever can occur year-round, malaria is more prevalent after the rainy season. (GDHS, 2014) Fever is an important indicator of malaria, this was confirmed by the Iwuafor study that tested all children with malaria for fever. All the 40.1% who reported of fever tested positive for RDTs and microscopy. Hence fever was associated with malaria in children aged 0-59 months.

In conclusion, very little information on home visit in East Akim Municipality was noted. In a study conducted by Ahorlu et al in 2011 revealed a parasite reduction from 25% to 3% when Community Health Officers undertook home visit for administration of chemoprophylaxis for children under the age of five. Little was known of the contribution of home visit by CHOs in reducing the burden of diseases on public health importance in the country. Hence the essence for a research to assess the contribution of this important service in improving public health outcomes.

2.5 Conclusion

This chapter reviewed studies conducted by researchers. The review of literature was related to studies that explored home visit and it's influence on the health of individuals with specific reference to children younger than five years. Interventional and cohort studies were mostly reviewed. The present study contributed to the gaps that were identified during the literature review.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The method session is an important area in research. This section of the research describes the core activities of the study. The study design, location of study, variables, sample size, method of sampling, data collection method, technique for data collection, processing of data, analysis and ethical considerations were covered in this section. How the research was conducted is explained in details in this section.

3.2 Study Design

A cross sectional study design was used as the design for gathering data on the influence of home visits of the Community- Based Planning and Services in relation to under five malaria morbidity.

3.3 Study Area

3.3.1 Population size, structure and composition

The East Akim Municipality was among the twenty six administrative districts in the Eastern region of Ghana. It covers a land area of 950 square kilometres. In terms of spatial interaction, it is bordered to the North by Atiwa and Fanteakwa Districts, to the East by New Juabeng Metropolis and Yilo Krobo District to the South by the Suhum Municipality and Ayensuano District, to the West by Denkyembour District and West Akim Municipality.

The Municipality had Kibi as its Administrative and traditional capital which was about 56 kilometres from the regional capital Koforidua.

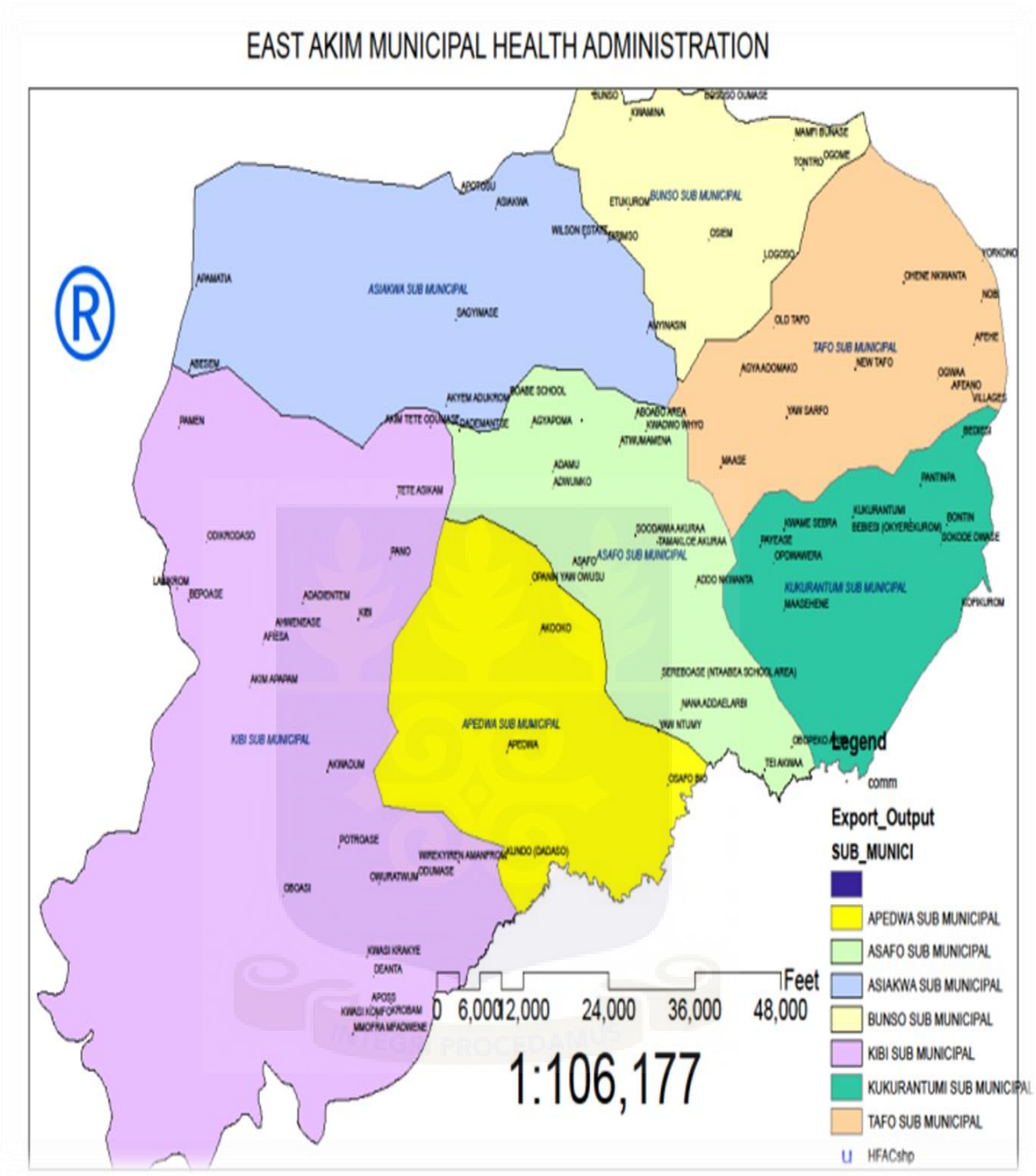


Figure 1: East Akim Municipal Health Administration

The Municipality consist of Eight (8) sub Municipals namely; Apedwa, Asafo, Asiakwa, Bunso, Kibi, Kukurantumi, Potroase and Tafo as shown in figure 1.

It has 237 communities and a projected population estimated at One Hundred and Eighty-Six Thousand Two Hundred and Eighty-One (186,281).

Table 1: Projected population distribution in the Municipality 2015

SUB-MUNICIPAL	Proj. pop 2015	WIFA 24.4 %	Exp Preg 4%	Chn 0-11 4%	Chn 12-23 2.5 %	Chn 24-59 8.2 %	Chn 0-59 13.6 %	Adolescents 22.9 %
Apedwa	22,420	5,470	897	897	561	1,838	3,049	5,134
Asafo	20,699	5,051	828	828	517	1,697	2,815	4,740
Asiakwa	16,947	4,135	678	678	424	1,390	2,305	3,881
Bunso	20,412	4,981	816	816	510	1,674	2,776	4,674
Kibi	30,220	7,374	1,209	1,209	756	2,478	4,110	6,920
Kukurantumi	21,718	5,299	869	869	543	1,781	2,954	4,973
Potroase	16,180	3,948	647	647	405	1,327	2,200	3,705
Tafo	37,685	9,195	1,507	1,507	942	3,090	5,125	8,630
TOTAL	186,281	45,453	7,451	7,451	4,657	15,275	25,334	42,658

Source East Akim annual report, 2015

3.4 Ethnic Group

The major ethnic group in East Akim was the Akyem. Other, minor tribes existed, which were the; Ewes, Frafras, Dagartis, Krobos, Akwapim, Ashantis and more.

3.5 Economic Activities

The main economic activities in the municipality are farming, petty trading, small-scale industries and small scale mining (Galamsey).

3.6 Rainfall Patterns

There are two (2) main seasons. These were the, wet season which starts from April and ends in October, and the Dry season which also starts from November, and ends in March. More cases of malaria were recorded in the raining season especially August to October.

3.7 Vegetation

The main vegetation of the municipality was forest with traces of savannah in the North Eastern Sector.

3.8 Road Network

The road network in the municipality was fairly good. The old Kumasi-Accra road passed through the municipal capital whiles the new road now passed through Apedwa, and Asafo. All the other sub- municipalities have tarred roads with major towns linked with tarred roads. The feeder roads are well maintained.

3.9 Water and Sanitation

The people of East Akim have water supply from the following sources e.g. pipe borne, Boreholes, wells and river Birim. Currently galamsey activities have polluted the main source of pipe borne water as a result the Ghana Water Company cannot supply treated water from the Birim River.

3.10 Telecommunication

All the major communication services providers namely Vodafone Ghana, Airtel, MTN and Tigo were available in the municipality for easy telephone communication and about 80%

of the adult population owed a mobile phone. Pay phones are also installed at vantage points in all major towns in the municipality for easy access.

3.11 Health Facilities

Health facilities providing health service delivery within the Municipality consist of public, private and CHAG.

The level of health facilities in the municipality were:

- Hospital
- Health centres
- Maternity Clinics
- Community clinics or Community-Based Health Planning and Services (CHPS).

3.12 Health Infrastructure

- Two Public hospitals
- One CHAG hospital
- Four Health Centres
- Three Private Maternity Clinics
- 18 functioning CHPS compounds (35 demarcated CHPS sites)
- 120 health volunteers
- 20 TBAs

Public Hospital

1. Kibi Government Hospital
2. Tafo Government Hospital

CHAG Hospital

- Hawa Memorial Saviour Hospital

Health Centres

1. Apedwa Health Centre
2. Asiakwa Health Centre
3. Bunso Health Centre
4. Asafo Health Centre

Private Maternity Clinics

1. Reliance Maternity Home
2. Willie Kings Maternity Home
3. Esther Twum Maternity Home

There are Thirty - Nine (39) demarcated with 20 functional CHPS zones with compounds

CHPS Zones

1. Akooko CHPS
2. Addonkwanta CHPS
3. Agyapomaa CHPS
4. Sagyemase CHPS
5. Adukrom CHPS
6. Oseim CHPS
7. Apapam CHPS
8. Asikam CHPS
9. Bomponso No. 1 CHPS
10. Bonponso No.2 CHPS
11. Maase CHPS
12. Amanfrom CHPS
13. Kwasi Komfo CHPS
14. Potroase CHPS
15. Odumasi CHPS
16. Tontro CHPS
17. Anweabeng CHPS
18. Anyinasin CHPS
19. Old Tafo CHPS
20. Kukurantumi CHPS

3.13 Political and administrative structure

The Municipal Assembly is the highest administrative and political authority in the Municipality. The Municipal Chief Executive is the Head of the Assembly; the Municipal Coordinating Director is the administrative head responsible for the coordination of the Municipal activities and also the various departments under the decentralization program. These departments include the Municipal Health Directorate and other departments. Meeting schedules by the Municipality are coordinated by the Municipal Coordinating Director. The MHD submits copies of annual reports to the Assembly and did attend briefing sessions.

3.14 Study Population

The population of interest were children aged less than five years in Kibi. Caregivers of children were individuals who catered for the needs of the child, responding to their needs included: caring, feeding and ensuring that when they are ill they were taken to a health facility and their health taken care of. More also, ensuring that the child took the necessary medications till they were well again. Among the population these age group of children are most vulnerable and have reduced immune capabilities of preventing infections such as malaria. The message of Community Health Officers are often targeted at improving the health of children and pregnant women. Home visit activities ensure that children under five years are adequately taken care of due to their vulnerability.

3.15 Sample Size Determination

In a research by Ahorlu et al (2009) on the topic effectiveness of combined intermittent preventive treatment for children and timely home treatment for malaria control in Keta district in the Volta region of Ghana. Malaria accounted for over 40% of outpatient clinic

attendance in the district. Reviewing the literature, the proportion of caregivers in rural areas with knowledge on the transmission of malaria was stated as 76%. There had not been any study in relation to malaria and home visit in East Akim Municipality, Kibi. Therefore using the proportion of knowledge in malaria transmission from the Ahorlu study as the proportion of caregivers with knowledge on causes of malaria, the sample size which comprised of 300 caregivers was derived for the study in Kibi.

Representing p with 0.76, a confidence interval of 95%, and 0.05 margin of error as d. In view of this the educational assumption of the sample size was calculated as show below

$$n = \frac{Z^2 \times P(1-P)}{d^2}$$

Thus sample size

$$n = \frac{1.96^2 * 0.76 (1-0.76)}{0.05^2}$$

n = 280.28 with an approximation to n=280

The total sample was estimated at 300 which took into account 20 additional caregivers. Thus, the sample size (n) = 280+20= 300. The 300 caregivers selected also took into account a 7% non-response rate. The 7% non-response rate was used having reviewed the literature for the study. Therefore, the minimum sample size of the study was 300 caregivers.

3.16 Sampling Method

A stratified random sampling was used for the study. The home visit book or note pad together with the daily activity books used by the CHOs was used during the research. The township was divided into 10 strata according to the demarcations of the town such as Ahenfie, Zongo No 1, Newtown and more. In the strata, a disproportionate stratified random sampling was used to select homes to be visited for the interview. The total population with

reference to 2015 projected population for 2017 in Kibi was obtained. The CHOs catchment population for the specific demarcated area was then divided by the 2015 total population, the result was then multiplied by the sample size of 300 to obtain the sample size for the specific demarcated area in Kibi. The total number of houses in Kibi was divided by the sample size and an interval was obtained to systematically select the house to visit. The interval was used to select subsequent houses for visit till all 300 caregivers were identified and interviewed from the different strata. If the 2nd house was selected as the first house to conduct the interview, the second house was the 5th house, then 8th house in that range till all 300 caregivers were interviewed. The homes which were visited included homes visited by CHOs and homes not visited by CHOs. All homes visited were in Kibi. Data collectors were assigned codes which ranged from 01 to 10. Each home visited was indicated as HV01/001, this indicated the first home visited by data collector 01. This was replicated for the other data collectors and the home each visited. In a home where more than one child was present simple random sampling was used, a box containing 'yes' and 'no' responses were given to each caregiver to pick from, after which the caregiver was selected and interviewed for the specific house. If two caregivers were to be selected, then if one caregiver picks 'yes' then that same yes was put back for the next caregiver to select from. Therefore, a replacement random sampling technique was employed. At the end of the sampling all 300 caregivers with children under five years were selected.

3.17 Data Collection Tool

A questionnaire was developed and used for data collection during the research. Administering of the questionnaire was done through a face to face interview session away from happenings that can interrupt the interview process. Questions were mostly in closed format, close ended form allowed for easy analysis and reduced respondent sitting time so

as not to introduce social desirability answers. A comprehensive and clear picture of the situation was produced by respondents. The questionnaire had an introduction session, socio-demographic factors, Issues discussed during home visits by CHOs and knowledge attitude and practices of caregivers with outcome as malaria reported present or absent for the preceding two weeks of the study.

The questions were stated in English and read to participants in the Twi language during the interview process. Also at the training of data collectors, emphasis was placed on back translation where after reading the question in English, the interviewer then reads the Twi version of the question and finally translate the question back to English for same level comprehension between a data collector and a caregiver. This was important as a common understanding was built for each data collector hence strengthening quality control. The training process lasted for two (2) working days.

The start time for each training session for the data collectors begun at 8:30 am in the morning and ended at 4:00pm in the evening, there was no accommodation for data collectors. Therefore the training started and closed early to facilitate easy transportation of data collectors back home. A designated location for the training was acquired to ensure that data collectors were comfortable and fully participated in the training. Role play of questions during training was ensured.

3.18 Limitation of the study

A limitation of the study was not testing for malaria parasite. Malaria reported by caregivers in the preceding two weeks of the study was the indicator used to determine presence or absence of malaria in children less than five years to determine the outcome variable. The study was related to children younger than five years.

3.19 Variables of the Study

The main outcome variable in the study was self-reported malaria in children less than five years by caregivers (malaria present or absent). The primary independent variable was home visit embarked by Community Health Officers, other independent variables included: age of mother (caregiver) and child aged between 0-59 in completed months, sex of caregiver, health seeking behavior, proportion of homes visited by CHO and proportion of follow ups, religion of caregiver, knowledge attitude and practices of caregivers, mode of transmission of malaria, signs and symptoms of malaria, environmental safety practices, medication adherence, Socio economic status of caregiver, malaria intervention strategies were the variables to be measured.

3.20 Data Management and Analysis

Five to ten minutes was spent on each completed questionnaire to ensure completeness of data at the field by the researcher before being processed for entering into stata version 14. During the preparation of the questionnaire a code was assigned to each answer of a question to facilitate data entry into stata version 14. These codes were used during the data entering process for easy analysis in stata version 14. Stata works with numbers than text files. Analyzed data were presented as tables, histograms, pie charts and also in text format. Presentation of data were in the form of student t test for the ages in means and standard deviations, chi square analysis and strength of associations (crude and adjusted measures of associations) were used. Correlation or cross-tabulation were used for the variables during data analysis.

3.21 Ethical Consideration

Ethical approval was important before the start of any research or data collection process. The IRB with whom the approval was sought from was the Ghana Health Services Ethical Review Committee. The reference number was GHS-ERC: 34/12/16. The Municipal Chief Executive and the Municipal Director of Health Services in East Akim were contacted for their approval before collection of data and implementation of research. A written letter from the department of Population, Family and Reproductive Health was obtained and approval for data collection granted from the office of the Municipal Director of Health Services, Kibi. After completion of the research, a copy of the report was sent to the Municipality to inform policy makers about the findings in other to help improve health indicators of children under five years in the Municipality. Funding of the study was borne by the PI, there were no associated conflict of interest for the purpose of this research. This study is purely an academic exercise in partial fulfillment of the award for Maters in Public Health.

Respondents were made up of caregivers of children under the age of five years. The caregivers were either females or males who attended to the day to day needs of the child. These included bathing, eating, going to school, caring for the child when ill, ensuring the right intake of medication, sleeping and other household activities associated with upbringing of the child.

Consent seeking was important when working with individuals under the age of eighteen (18) years. Therefore, consent was sought from either parents or guardian before proceeding to be interviewed. A consent form was prepared and signed by the guardian or parent before interview commenced. Participants had the free withal to opt out of the study during the interview. No participant was cohersed in participating in the research. Refusal to participant was welcomed without any hard feelings.

The interview was conducted on a one-to-one basis in an environment devoid of distraction and disturbance. The aim of the study was communicated to participants for their informed consent. A section of the questionnaire had consent granted by participants and either thumb printed or signed against to show consent and willingness in participating in the study.

For participant below 18 years, an assent form was made available for their parents/guardians to consent and signed or thumb printed before they were interviewed. Respondent confidentiality was protected by using codes for questionnaires, no names were written on the questionnaire before interview begun. Data collectors were advised on the need to protect respondents' identity and also made to realize that they had legal issues to deal with if they inform other people who are not in the study about conversations they had with respondents. The data collected was stored in an external disc format on the researcher's computer. A designated locking system was procured purposely for storing data (completed questionnaire). A lock was firmly in place to prevent anyone from having access to the classified files. Only the researcher has access to the cabinet. No other party was given access to the data collected from participants without the consent of the participants and the PI.

The study involved administration of questionnaires with no harm to participants. However, the only issue associated with the study was the time made available by participant who agreed to take part in the study. There was no compensation package for participants. Participants were made aware that, this was only an academic exercise which would later influence policies to ensure that education was provided to caregivers in the right manner in other to effect behaviour change. The questionnaire took between 20 to 30 minutes. After which respondents were given the opportunity to ask any question pertaining to the study

3.22 Conclusion

This chapter discussed the methods employed in the study; sampling technique, calculation of sample size, data analysis and ethical considerations were clearly discussed.

CHAPTER FOUR

RESULTS

The findings from this study are presented in this chapter. Findings related to demographic characteristics and factors associated with home visits by Community Health Officers (CHOs) are presented in this chapter. The results are presented in frequencies and proportions using tables for comprehension.

A total of 300 caregivers were interviewed for the study. Table Two shows the demographic characteristics of respondents. The mean age for caregivers was 30.5 ± 0.5 years (CI: 29.45-31.48). Mean age for children less than five years was 22.2 ± 0.8 in completed months (CI: 20.53-23.89).

Table 2: Demographic characteristics of respondents

Variable	Number of respondents N=300	Proportion (%)
Age of Caregivers in years		
15-19	24	8.0
20-29	135	45.0
30-39	86	28.7
40-49	46	15.3
50-59	8	2.7
60-69	1	0.3
Age of Children in completed months		
<6	33	11.0
6-11	46	15.3
12-23	86	28.7
24-35	61	20.3
36-47	42	14.0
48-59	32	10.7
Sex of Caregivers		
Male	22	7.3
Female	278	92.7
Sex of Children		
Male	151	50.3
Female	149	49.7
Marital status of Caregivers		
Single	41	13.7
Married	156	52.0
Co-habitation	83	27.7
Divorced	12	4.0
Widow/ widower	8	2.7
Education		
Never attended school	19	6.3
Primary	120	40.0
Secondary	131	43.7
Tertiary	30	10
Religion		
Islam	53	17.7
Christianity	234	78.0
Traditional	12	4.0
Others	1	0.3
Occupation		
Business	114	38.0
Farmer	117	39.0
Student	25	8.3
Professional	44	14.7

Less than half (45%) of caregivers were between the ages of 20-29 years. Also, children less than six (6) months formed 11% of the sample. Less than a third (28.7%) of children were within 12-23 months of age. A proportion of 10.7% represented children aged 48-59 months. This cohort formed the least representation for age groups of children within 0-59 months.

From Table 2, 92.8% of caregivers were females and 7.3% were male caregivers. Male children aged between 0-59 months formed 51.3% and the females were 48.7%.

Caregivers with secondary education formed the largest proportion with 43.7% of total caregivers interviewed while, primary education made up 40.0%. Caregivers with tertiary education formed 10% of total respondents.

On religious affiliation as shown in Table 2 Christians were 78%, Islam 17.7%, Traditional believers 4.2% and caregivers who did not believe in any of the three mentioned faiths comprised 0.3% of respondents. Most caregivers were employed or engaged in a form of revenue generation. Farmers constituted 39% a representing a largest proportion of caregivers in the occupational sectors in Kibi. Caregivers engaged in businesses comprised 38% with professionals representing 14.5% of respondents.

4.1 Home visit component of Community-Based Health Planning and Services in Kibi

Caregivers who were aware of the nurse home visit programme formed 66% of the sample and 34% of caregivers were not aware of any home visit programme by Community Health Officers in Kibi. Table 3 shows the various component used to measure the home visit programme by Community Health Officers.

Table 3: Home visit component of Community-Based Health Planning and Services

Component of home visit	Frequency	Percent
Know Nurse home visit programme		
Yes	198	66.0
No	102	34.0
Ever visited by a Nurse		
Yes	141	47.0
No	159	53.0
Frequency of home visit		
Once a week	47	15.7
Two times a week	25	8.3
Three times a week	7	2.3
Once in a month	57	19.0
Never received any visit*	164	54.7
Duration of home visit		
Less than 30 minutes	44	15.0
Greater than 30 minutes	82	27.3
Greater than or equal to 1 hour	10	3.3
No duration available	164	54.3
Health topics discussed during a visit		
Diarrhoea	35	11.3
Malaria	86	28.7
Respiratory diseases	17	5.7
No areas for discussion*	164	54.3
Agreed for a follow up visit		
Yes	100	33.3
No	36	11.7
Not indicated*	164	55.0
Occurrence of follow up		
Yes	64	21.3
No	72	24.0
Not indicated*	164	54.7

*Caregivers who did not receive any home visit from CHOs

On the question of whether caregiver had received a visit from a CHO or a nurse, 47% stated they had ever received visit by a CHO and 53% responded to have never received a visit by a CHO in Kibi.

4.1.1 Frequency of home visits

One of the specific objectives of the study was to determine frequency of home visits by CHOs in Kibi. Table 3 shows home visit component of the CHPS programme. Less than a quarter (19.0%) of caregivers indicated that, the visit occurred once in a month while a greater proportion (58.7%) of caregivers mentioned that CHOs had not visited them in their homes. For home visit to have a maximum impact, visit of two times a week is the recommended practice. However, from Table 3, the recommended practice did not feature as the maximum for frequency of home visit in Kibi.

Table 3 also shows the duration of visit by CHOs in Kibi. A small proportion of caregivers (27.3%) indicated that the visit by the CHOs lasted for more than 30 minutes; 15% said the visit lasted for less than 30 minutes; 3.3% also said the visit lasted for greater than or equal to an hour. For health issues discussed, the frequently discussed topics during home visit by Community Health Officers were: malaria (28.7%), diarrhea (11.3%) and respiratory tract infections (5.7%). These were for caregivers who had received a visit from a CHO.

On agreeing for follow up visits by CHOs, 33.7% of caregivers indicated a follow up visit by a CHO while 11.7% reported no indication of follow visit by CHOs. These indications were made by caregivers who had received visits from a CHO. More than half of caregivers indicated no visits by CHOs hence no follow ups could be made. These were observed from Table 3 as shown above.

Occurrence of follow up measured whether the actual follow up took place. From Table 3, responding to the occurrence of follow up visit by caregivers: 21.3% affirmed the occurrence of follow up visits by CHOs while 24.0% comprised of non-follow ups by CHOs. Non-occurrence of home visit formed the larger portion of whether follow up occurred or did not occur. Follow up home visit which was never indicated was 54.7%. These were caregivers who were never visited by a CHO.

4.2 Awareness, Knowledge, Attitude and Practices about malaria

Awareness of malaria by caregivers was studied as part of the research. This was to determine whether caregivers were aware that malaria existed in Kibi. Majority of caregivers (99.3%) indicated that they were aware of malaria as a disease that affect individuals including children under five years. This is shown in Table 4. Source of information where, caregivers became aware of malaria included: hospital 38.7%, home visit by a Community Health Officer 30.0%, radio 15%, suffered from malaria 14.7% and health durbars 1.7%.

Table 4: Awareness, knowledge, attitude and practices of caregivers about malaria

Characteristics	Frequency	Proportion
Awareness of malaria		
Yes	298	99.3
No	2	0.7
Place of awareness		
Hospital	116	38.7
Home visit by a Nurse	90	30
Radio	45	15
Suffered from malaria	44	14.7
Health durbars	5	1.7
Knowledge on malaria		
Main sign of malaria in children 0-59 months		
Headache	26	8.7
Fever	195	65
Chills	29	9.7
Loss of appetite	8	2.7
Vomiting	27	9.0
Weakness	7	2.3
Do not know	1	0.3
Causes of malaria		
Germs	4	1.3
Plasmodium parasite	63	21.0
Bushy environment	28	18.9
Weakness	10	6.8
Bite from infective female anopheles mosquito	165	55
Dirty environment	2	0.7
Other	1	0.3
Do not know	1	0.3
Transmission of malaria		
Plasmodium parasite	15	5.0
Through bites of an infective anopheles mosquito	224	74.7
Dirty/ stagnant water	50	16.7
Bushy environment	9	3.0
Weakness	2	0.67
Attitudes towards malaria		
Care seeking options if child develops malaria		
Perceived cost	29	9.7
Condition of child	226	75.3
Attitude of hospital staff at the health facility	24	8
Time of day illness started	21	7
Practices of caregivers		
LLIN availability		
Have LLIN	274	91.3
Do not have LLIN	25	8.3
Do not know	1	0.3
Quantity of LLIN available		
None	26	8.7
1-3	253	84.3
Greater than 3	21	7.0
Place of acquiring LLIN		
Hang up campaign	42	14
Child Welfare Clinic	82	27.3
Antenatal services	88	29.2
Household distribution using coupons	63	21
Others	4	1.3
None	21	7.0
LLIN use during the previous night		
Yes	181	60.3
No	191	39.7

Table 4 shows the knowledge, attitude and practices about malaria. Assessing KAP of malaria was one of the specific objectives in the study. Caregivers who identified fever as the cardinal sign of malaria were 195 (65%) of the sample. Knowledge from Table 4 was stratified into three sign, cause and mode of transmission of malaria. The cardinal sign of malaria was a critical component of understanding malaria and the relationship with fever. Caregivers interviewed on cardinal sign of malaria as fever were 65% of the sample. This implies that more than half of respondents knew the cardinal sign used in identifying malaria in children below five years. This proportion is good compared to other studies which reported less than 50% of caregivers in identifying fever as the major sign of malaria for children below five years. In Table 4, caregivers who identified chills as a cardinal sign of malaria formed 9.7% of total respondents with 0.3% representing caregivers who did not know any cardinal sign of malaria. More than half of caregivers were able to identify fever as the cardinal sign of malaria.

On the question on what causes malaria in Kibi, caregivers attributed cause of malaria to bite of infective female anopheles mosquito. This represented 55% of the sample. This is shown in Table 4. The main cause of malaria is plasmodium parasite. From Table 4, 21.0% of caregivers were able to identify cause of malaria as a result of plasmodium parasite in the blood. Bushy environment, weakness, germs, dirty environment and others formed 17%, 4.3%, 1.3%, 0.7% and 0.7% respectively. Therefore, proportion of caregivers who were able to correctly identify cause of malaria was 21.0% of the sample. However, this is poor as compared to other literature findings.

4.2.1 Malaria transmission

From Table 4, most (74.7%) caregivers had accurate knowledge on transmission of malaria. More than half of caregivers (74.7%) indicated that malaria was transmitted through the bite of an infective female anopheles mosquito. This means that most caregivers knew how

malaria was transmitted. 5% of caregivers associated transmission of malaria with plasmodium parasite while 0.7% of caregivers associated malaria transmission to weakness of an individual.

4.2.2 Attitude of caregivers about malaria

On the question of seeking care for a child with malaria, majority (75.3%) mentioned condition of child such as rise in temperature was the major determining factor to seek care from a health facility. A little proportion (9.7%) of caregivers indicated, perceived cost that would be borne at the health facility while 8% attributed care seeking to attitude of hospital staff. Additionally, a small proportion (7%) of caregivers stated the time of day malaria started for the child would indicate whether to seek care for the child or not. This is shown in Table 4. These were the reasons caregivers enumerated when the question of care seeking was posed.

4.2.3 Practices of caregivers towards malaria prevention

Availability of long lasting insecticidal bed nets is an important component in the prevention of malaria in endemic countries. Most caregivers (84.3%) reported 1-3 LLIN were available for use at the household. From Table 4, majority of caregivers (91.3%) said they have an LLIN, 8.3% indicated otherwise while 0.3% did not know whether they had an LLIN or not. For the 91.3% who reported of having an LLIN, did also indicate the sources from which the LLIN was obtained. These were: from ANC (29.3%), child welfare clinics (27.3%), household distribution with coupons (21.0%), hang-up campaign (14.0%) and others were 1.3% of the sample. These can be observed on Table 4.

4.2.4 Use of LLIN by children younger than five years

The key component of use of LLIN was whether the index child slept under the LLIN the previous night. Majority of caregivers 60.3%, (0.63±0.03, 95% CI=0.55-0.66)) indicated

that the child younger than five years had slept under the LLIN the previous night while 39.7% said the index child did not. This is shown on Table 4.

4.3 Malaria treatment option of caregivers

One of the specific objectives was to assess options for management of malaria in children younger than five years in Kibi. Table 5 represents malaria treatment options for children less than five years

Table 5: Options for treating malaria

Treatment option	Frequency	Percent
Provision of home based therapy	44	14.7
Takes child to the health facility	180	60.3
Provide medication and immediately takes child to health facility	56	18.7
Use herbal treatment	4	3.3
Give ACTs	6	2.0
Others	1	0.3

From Table 5, majority of respondents (60.3%) indicated that child would be taken to a health facility for management of fever. Close to 19% of caregivers said they would provide medication before child was taken to the health facility. Of the 18.7% who would provide medication, close to 92% indicated paracetamol as the medication to be given before child was taken to the hospital. 14.7% of caregivers also said home-based therapy was provided for the child, 3.3% of caregivers indicated use of herbal medication for management of malaria while 2.0% reported that ACTs was provided for children younger than five years with malaria.

4.4 Under five malaria prevalence

One of the specific objective of the study was to determine household reported symptoms of malaria in Kibi. On the question of whether in the preceding two weeks of the survey the index child had malaria or did not, had visited any health facility or initiated any home based medication for the child. This was later classified into malaria present or absent, with the outcome of interest as malaria absent. This later was used as an indicator for the outcome variable for under five malaria prevalence.

Table 6: Prevalence and treatment of malaria in children less than five years

Variable	Frequency	Percent
Malaria prevalence		
Present	152	50.7
Absent	148	49.3
Treatment for the 49.3% children with presence of malaria		
Sent child to health facility for treatment	88	59.5
Medication given before visiting the health facility	26	17.6
ACTs administered at home	21	14.9
None ACT home based management	3	2
Use of herbal medication	10	6.8

From Table 6, caregivers who reported absence of malaria following the visit by a CHO constituted 50.7% (0.51, 95% CI= 0.45-0.56) while caregivers who reported presence of malaria formed 49.3% of total respondents. Also from Table 6, the 49. 3% of caregivers who reported presence of malaria undertook various treatment, these were: provision of home-based therapy 14.9%, administration of ACTs at home 14.9%, none ACT home based management 2%, treatment at the health facility 59.5%, medication given before visiting health facility 17.6% and use of herbal medication 6.8%.

4.5 Socio demographic factors associated with malaria

To determine the factors associated with home visit influence on malaria in Kibi, the study first looked at demographic factors that were associated with absence or presence malaria in children younger than five years. In this regard, a bivariate analysis was developed to determine the association between various demographic variables and absence of malaria in children younger than five years. These findings are shown in Table 7. From the chi square, it was observed that age of caregiver was associated with absence of malaria in children less than five years ($p< 0.05$). Absence of malaria as reported by caregivers was significant for age group 20-29 (47.4%). Caregivers within age group 20-49 were more likely to report absence of malaria as compared to other age groups in the study. Educational status was also found to be associated with reported absence of malaria in children younger than five years ($p<0.01$). Caregivers who had attained lower education were significantly associated with reported absence of malaria in children. Proportions were primary 73% and secondary 47.3%. Respondents with primary and secondary education were more likely to report absence of malaria in children less than five years. Increase in educational status were more associated with presence of malaria than lower educational status and caregivers who had never attended school. The proportions for presence of malaria in relation to educational attainment were as follows: never attended school (73.7%), primary (39.2%), secondary (52.7%) and tertiary was 60.0%. Caregivers in a co-habitating relationship also reported a significant proportion of malaria absence in children (54.2%). Generally caregivers who lived together with a partner were likely to report absence of malaria compared to caregivers living without a partner with the exception of respondents who were single (58.2%). Majority (50.7%) of caregivers who were married reported absence of malaria compared to never married or divorced. However no association was found between sex of both caregiver

and child, marital status, religion and occupation of caregiver, and absence of malaria in children aged less than five years.

Table 7: Socio-demographic characteristics associated with malaria

Variable	Presence of malaria N= 148 (%)	Absence of malaria n = 152 (%)	Chi square P value
Age of Caregivers in years			**p=0.05***
15-19	5(20.8)	19(79.2)	
20-29	71(52.6)	64(47.4)	
30-39	46(53.5)	40(46.5)	
40-49	21(45.7)	25(54.3)	
50-59	5(62.5)	3(37.5)	
60-69	0(0.0)	1(100)	
Age of Children in completed months			**p= 0.24**
<6	18(54.5)	15(45.5)	
6-11	22(47.8)	24(52.2)	
12-23	44(51.2)	42(48.8)	
24-35	22(36.1)	39(63.9)	
36-47	25(59.5)	17(40.5)	
48-59	17(53.1)	15(46.9)	
Sex of Caregivers			**p= 0.34**
Male	13(59.7)	9(40.9)	
Female	135(48.7)	143(51.4)	
Sex of Children			**p= 0.73**
Male	73(50.3)	78(49.7)	
Female	75(50.3)	74(49.7)	
Marital status of Caregivers			**p= 0.26**
Single	17(41.5)	24(58.5)	
Married	79(50.6)	77(49.4)	
Co-habitation	38(45.8)	45(54.2)	
Divorced	9(75)	3(25)	
Widow/ widower	5(62.5)	3(37.5)	
Education			**p= 0.01***
Never attended school	14(73.7)	5(26.3)	
Primary	47(39.2)	73(60.8)	
Secondary	69(52.7)	62(47.3)	
Tertiary	18(60)	12(40)	
Religion			**p= 0.48**
Islam	26(49.1)	27(50.9)	
Christianity	114(48.7)	120(51.3)	
Traditional	8(66.7)	4(33.3)	
Others	0(0)	1(100)	
Occupation			**p= 0.24**
Business	48(42.1)	66(57.9)	
Farmer	64(54.7)	53(45.3)	
Student	14(56.0)	11(44.0)	
Professional	22(50.0)	22(50.0)	

*p<0.05

4.6 Home visit and other factors associated with absence or presence of malaria

In addition to socio-demographic characteristics, the study also investigated other factors that may be associated with absence or presence of malaria in children less than five years using bivariate analysis. This is shown in Table 8. From the chi square analysis, an association was observed for homes visited and reported absence of malaria ($p< 0.01$). The more visit by a CHO to the caregiver the less reported absence of malaria. Also, Frequency of home visit was associated with absence of malaria ($p< 0.01$). Increased number of visit by a CHO were more likely to increase the number of children with absence of malaria. From Table 8, most frequently visited home was associated with absence of malaria. Furthermore, Presence of malaria occurred in homes which were never visited (64.2%).

Duration of home visit and topics discussed were significantly associated with reported absence of malaria in children less than five years. The longer the time spent per visit the more the number of children with absence of malaria ($p<0.03$). Also, the more the number of topics discussed on malaria the more report on absence of malaria in children (0.01). During the study, follow up visits on agreed practices for certain doable actions such as use of LLIN had significant association with absence of malaria in children less than five years ($p <0.02$). The more follow up on agreed practices the more number of reports on absence of malaria. Occurrence of follow up visit also had a significant association with absence of malaria in children as shown in Table 8. Generally home visit factors had a significant association with absence of malaria in children younger than five years.

Table 8: Home visit and other factors that influence malaria in children

Factors	Presence of malaria N=148 (%)	Absence of malaria N=152 (%)	p value
Ever visited			**p= 0.01***
Yes	53(35.8)	88(57.9)	
No	95(64.2)	64(42.1)	
Frequency of home visit			**p = 0.03***
Once in a week	21(14.2)	26(17.1)	
Two times a week	8(5.4)	17(11.2)	
Three times in a week	4(2.7)	3(2.0)	
Once in a month	20(13.5)	37(24.3)	
Never visited	95(64.2)	69(45.4)	
Duration of home visit by CHO			**p= 0.03***
Less than 30 minutes	19(12.8)	26(17.1)	
Greater than 30 minutes	31(21.0)	51(33.6)	
Greater than or equal to one hour	5(3.4)	5(3.3)	
No duration	93(62.8)	70(45.1)	
Health topics discussed during visit by CHO			**p= 0.01***
Diarrhoea	11(7.4)	23(15.1)	
Malaria	38(25.7)	48(31.6)	
Respiratory diseases	5(3.4)	12(7.9)	
No health discussion diseases	94(63.5)	69(45.4)	
Agreed for a follow up visits			**p= 0.02***
No	12(33.3)	23(66.7)	
Yes	41(41)	59(59)	
Never indicated	95(57.6)	70(42.4)	
Occurrence of follow up visit			**p= 0.01***
No	25(39.1)	47(60.9)	
Yes	29(40.3)	35(59.7)	
Never	94(57.3)	70(42.7)	

*$p < 0.05$

4.7 Logistic regression of factors that influence malaria prevalence

The multiple logistic regression was used to adjust for demographic and home visit variables. Additionally, the strengths of association were also determined. From Table 9, homes ever visited had a statistically significant association with reported absence of fever in children less than five years (AOR=3.10, 95% CI= 1.09-8.86). In controlling for all other variables listed in Table 9 which includes: educational status, frequency of home visits, malaria transmission, health topics discussed and age of caregiver. Homes which were visited by CHOs had 3.10 the odds in reporting absence of malaria for children less than five years than homes which were not visited. Havened reported an earlier crudes odds ratio of 2.08, the increase in the adjusted odds ratio implies that home visit had a statistically significant association with absence of malaria as reported by caregivers. Sleeping under an LLIN the previous night was also associated with reported absence of malaria in children less than five years (AOR= 2.11, 95% CI= 1.14-3.92). Having adjusted for all other factors listed in Table 9 which includes: educational status, frequency of home visits, malaria transmission, health topics discussed, home visit and age of caregiver, children who slept under an LLIN had 2.11 the odds in reporting absence of malaria by their caregivers compared to children who did not sleep under the LLIN the previous night. Thus, children who slept under an LLIN were 2.11 more likely to report absence of malaria compared to children who did not sleep under the LLIN. Furthermore, malaria as a topic discussed during home visit also had a significant association with reported absence of malaria, having controlled for all other factors listed in Table 9 (AOR= 0.16 95% CI= 0.05-0.51). In adjusting for all other factors, malaria as a topic which was discussed by CHO and caregiver had a reduced odds of 84% in reporting presence of malaria for children less than five years compared to discussing diarrhea as a topic. Additionally, age group of caregiver had a significant association with reported absence of malaria in children as reported in Table 9.

Therefore, in adjusting for all other variables listed in Table 9, a unit increase in the age of caregiver within age group 20-29 had a reduced odds of 79% in reporting presence of malaria compared to age group 15-19 (AOR= 0.21, 95% CI= 0.06-0.71). Also age group 30-39 had a reduced odds of 77% in reporting presence of malaria compare to age group 15-19. Furthermore, age group 40-49 had a reduced odds of 74% in reporting presence of malaria compared to 15-19 age group while age group 50-59 also had a reduced odds of 84% in reporting presence of malaria compared to age group 15-19 years. Therefore older caregivers were less likely to report presence of malaria in children.

Table 9: Logistic Regression of factors that influence malaria in children

Factors	Crude OR(95%CI)	p- value	Adjusted OR(95%CI)	p- value
Age of Caregivers in years				
15-19	Ref			
20-29	0.24(0.08-0.07)	0.01*	0.21(0.06-0.71)	0.01*
30-39	0.23(0.08-0.67)	0.01*	0.23(0.06-0.84)	0.03*
40-49	0.31(0.01-0.98)	0.05*	0.26(0.07-0.99)	0.05*
50-59	0.16(0.03-0.89)	0.04*	0.24(0.27-2.07)	0.19
60-69	1	1		
Education				
Never attended school	Ref			
Primary	4.35(1.47-12.87)	0.01*	3.16(0.95-10.55)	0.06
Secondary	2.52(0.86-7.39)	0.09	2.76(0.85-9.04)	0.09
Tertiary	1.87(0.53-6.55)	0.33	1.82(0.44-7.55)	0.41
Home visit	Ref			
Yes	2.08(1.30-3.33)	0.01*	3.10(1.09-8.86)	0.03*
Frequency of home visit				
Once in a week	Ref			
Two times a week	1.72(0.62-4.75)	0.30	1.86(0.53-6.60)	0.33
Three times in a week	0.61(0.12-3.01)	0.54	0.78(0.09-6.71)	0.82
Once in a month	1.5(0.68-3.30)	0.32	2.03(0.71-5.81)	0.19
Never visited	0.59(0.31-1.13)	0.11	0.16(0.01-2.18)	0.17
Duration of home visit by CHO				
Less than 30 minutes	Ref			
Greater than 30 minutes	1.20(0.57-2.52)	0.63	2.08(0.84-5.13)	0.11
Greater than or equal to one hour	0.73(0.19-2.89)	0.65	0.62(0.12-3.26)	0.57
No duration	0.55(0.28-1.01)	0.08	3.85(0)	0.9
Health topics discussed during visit by CHO				
Diarrhoea	**Ref**			
Malaria	0.60(0.26-1.39)	0.24	0.16(0.05-0.51)	0.01*
Respiratory diseases	1.15(0.32-4.07)	0.83	0.37(0.07-2.04)	0.25
No topics	0.35(0.16-0.77)	0.01*	0.14(0.00-4.67)	0.27
Follow up visits				
No	Ref			
Yes	0.75(0.34-1.68)	0.49	1.24(0.36-4.20)	0.73
Do not know	0.35(0.05-2.37)	0.28	1.15(0.00-1.01)	0.98
Not indicated	0.39(0.18-0.83)	0.02*	1.11(0.00-1.02)	0.98
Occurrence of follow up visit				
No	Ref			
Yes	0.64(0.32-1.28)	0.21	0.53(0.17-1.61)	0.26
Never	0.40(0.22-0.70)	0.01*	0.10(0.01-1.77)	0.12
Malaria transmission				
Plasmodium parasite	Ref			
Through the bite of an infective female mosquito	1.07(0.37-3.31)	0.91	1.80(0.54-5.91)	0.33
Dirty or stagnant water	0.45(0.14-1.45)	0.18	1.03(0.26-4.01)	0.97
Bushy environment	0.7(0.13-3.68)	0.67	1.14(0.17-7.85)	0.90
Weakness	1		1	1
LLIN utilization				
No	Ref			
Yes	2.68(1.66-4.32)	0.01^	2.11(1.14-3.92)	0.02*

*p<0.05, COR= Crudes Odds Ratio, AOR= Adjusted Odds Ratio, CI= Confidence Interval, Ref= Reference group

4.8 Conclusion

This chapter presented results from the survey. The results suggested that home visit was a key indicator associated with reported absence of malaria in children younger than five years in Kibi.

CHAPTER FIVE

DISCUSSIONS

5.0 Introduction

The study in Kibi was to determine the influence of home visit by Community Health Officers of the Community-Based Health Planning and Services on under five malaria prevalence. This discussion is about the findings from the study and compares the findings with other related studies conducted around the world. This chapter also discusses implications of the research.

5.1 Socio demographic factors

Less than half (45%) of caregivers were between the ages of 20-29 forming a percentage of 45%. Additionally, less than a third (28.7%) of children less than five years were within 12-23 months. The 12-23 months comprised of children 1-2 years of age. These findings of age in children were consistent with the GDHS (2014) report where less than a third (26%) of children were within 12-23 months of age. In a research by Iwuafor et al., (2016), the mean age of caregivers was 29.7 years. Comparing the mean age from the Iwuafor et al to our study mean of 30.5 ± 0.5 years (CI: 29.5-31.5) indicates no significant difference.

The finding on age of caregiver in the study implies that, for the success of an intervention with caregivers as the major component, then the focus should be on age group 20-29 as they form a significant portion. Furthermore from the study, majority (93%) of caregivers were females. These findings were consistent with a study conducted by Aa et al. (2016), which found 95% of caregivers to be females. These findings imply that targeting females in Kibi during home visit for health education is vital in ensuring improvement of health for children younger than five years. Sex of caregivers were not significant in reporting absence of malaria. Also from the multiple logistic regression, sex of caregivers were not associated

in reporting absence of malaria. In addition, Sex of caregiver had no influence with homes visited or not by CHOs in Kibi.

Additionally, both male and female children were more likely to report malaria. This finding was not consistent with the finding of Nyarko & Cobblah, (2014), in which more male children reported with malaria than females. From the multiple logistic regression sex of a child had no association with malaria.

Also, majority (77.7%) of caregivers were either married or co-habiting. Additionally, less than half (40.7%) of caregivers reported absence of malaria in children. This finding shows that parents who live together contribute to a healthy upbringing of children. However, this was not consistent with the research by Schoenborn & Interview, (2004) in which couples who were living together turn to have positive health outcomes compared to single, divorced and widowed individuals.

In the bivariate analysis, education was found to have a significant association with absence of malaria in children ($p<0.01$). Most (80.7%) of caregivers had primary and secondary education. The presence of a number of primary, secondary and tertiary educational facilities also contributed to the phenomenon of increased educational status in Kibi. For occupational status, the major occupation of caregivers in Kibi were farming (39%) and business (38%). This was consistent with the GDHS (2014) which reported that the major occupation of caregivers were sales and services while agriculture was the second major occupation.

5.2 Influence of Home visit on under five malaria prevalence

The study was to assess the influence of home visit as the primary independent variable in under five malaria prevalence. Caregivers were interviewed on whether they had ever received a visit from a CHO or had not received any visit from a CHO.

The multiple logistic regression analysis showed that homes ever visited by Community Health Officers had a significant association with absence of malaria in children than homes which were not visited (AOR=3.10, 95% CI= 1.09-8.86). Also, in adjusting for other variables such as age of caregiver, LLIN use and more, caregivers visited by Community Health Officers were 3.10 times more likely in reporting absence of malaria in children than caregivers who were not visited. Therefore, more homes should be visited to reduce the occurrence of malaria in Kibi.

During home visits a conducive environment was created between the health worker and caregiver. The caregiver had the opportunity to engage the health worker in any health related issue for adequate information to be provided for. This was consistent with findings from Baqui et al., (2008), Trial, Care, Reddy, & Bang, (2005) and Manandhar et al., (2004) which reported improvement in the health status of newborns and child survival as a result of visits made by CHW in South Asia. The findings on home visit in reducing malaria prevalence was also consistent with a research by Brenner et al. (2011) which involved a community-based intervention study using community volunteers as health workers to promote health for children in rural Uganda. From the research by Brenner, there were improvement in child health and decreased mortality in children. Therefore the findings from this study was consistent with the work by Brenner et al.

Furthermore, frequency of visit was associated with absence of malaria in children less than five years. Generally home visits turn to positively influence health of children and

caregivers. The cell content analysis showed that CHOs rarely visited caregivers. This findings was not consistent with the research by Fatungase, Amoran, & Alausa (2012) in which majority of scheduled visit by health volunteers was two times in a week. In Kibi the study showed that, the recommended proportion of two times a week visit was 8.3%. This however, was within the lowest frequency of visit by CHOs. If the necessary impact of home visit is required, then it is recommended that CHOs visit the homes of caregivers at least two times in a week. Also, duration of home visit had an influence on malaria ($p<0.03$) but with regards to the multiple logistic regression, duration and frequency of visit had no significant association with absence of malaria in children.

Malaria as a health topic was occasionally discussed (28.7%). Continuous discussion of health related topics increases the knowledge of caregivers hence improves preventive attributes of caregivers on malaria. Also, agreeing upon a follow up visit was associated with reported absence of malaria in children.

5.3 Awareness, knowledge, attitude and practices about malaria

Majority (99.3%) of caregivers were aware of malaria in Kibi (99.3%). These findings were consistent with the research by Hlogwana et al (2009) which reported awareness of malaria for 320 households as 93.1%. Source of information for awareness varied: with hospital and home visit constituting 38.67% and 30.0% respectively. This finding was again consistent with Hlongwana et al (2009) in which health facilities were the most reported source of awareness, community meetings were the second most reported source of awareness on malaria. In the introduction section of the data collection tool, malaria and home visit were mentioned, this might have made caregivers to state home visit by Community Health Officers as place of information for malaria awareness. Therefore, introducing information

bias from respondents. However, awareness status was not significantly associated with absence of malaria in children.

An important evaluation of knowledge was caregivers' ability to identify fever as a major sign of malaria in children. Generally a significant proportion of caregivers were able to identify fever as the major sign of malaria (65%). The finding was consistent with the research by; Iriemenam, Dosunmu, & Oyibo, (2011), Andargie, Abate; Abraham, (2013), Olayemi, (2012) for which majority of respondents demonstrated significant knowledge on the symptom of malaria. Also the findings from this study was consistent with the research by A. R. Trial et al., (2007) in a cohort study of caregivers in Uganda were knowledge of caregivers in relation to fever as the main symptom of malaria was stated by a majority of the respondents. Knowledge does not necessarily translate to practice resulting either in absence or presence of malaria in children less than five years. Caregivers' ability to identify fever as a sign of malaria does not reflect absence or presence of malaria in children. This finding was consistent with the findings of Singh et al, (2014) in which caregivers ability to identify fever as a symptom of malaria did not imply either presence or absence of malaria. However, homes which were or were not visited by CHOs varied in relation to ability to identify fever as the major sign of malaria (COR=0.75, 95% CI= 0.625-0.897, p value< 0.01).

For transmission of malaria, most caregivers attributed cause and transmission to bites from an infective female anopheles mosquito. From the WHO (2016), cause of malaria was due to plasmodium parasites for 90% of malaria cases. Transmission on the other hand was through the bite of infective female anopheles mosquito. From this finding, it shows that most (74.7%) caregivers knew how malaria was transmitted. It therefore stance to reason that important measures are taken to prevent mosquito bites, these measures should have LLIN as a major component.

For attitude about malaria, most (60%) of caregivers associated condition of child as the major factor in seeking care at the health facility, perceived cost that would be borne at the facility formed 9.7% and caregivers' assertion that time of day illness started also constituted 7%. This findings was consistent with Hlongwana (2009) in which respondents were asked what they would do if their child had fever, most caregivers 137 (68.5%) reported that they would go to a hospital. The most pressing factor was condition of child when deciding to seek formal care for children with malaria, this was reported by 52.0% of respondents followed by perceived cost, 38.5%. However there were no significant differences between homes that were visited by CHOs and homes that were not visited by CHOs in relation to care seeking for children in Kibi ($p > 0.05$).

For practice about malaria, most caregivers indicated that, they had an LLIN present in their home (91.3%). This was however no significant for homes visited and not visited by Community Health Officers. Source of acquisition was high for areas where pregnant and children were cared for. These were: child welfare clinics (27.3%) and antenatal services (29.3%). These two areas constituted 56.6%. Sleeping under an LLIN was an indicator for utilization of LLIN and prevention of malaria GDHS (2014). Out of the 300 caregivers interviewed 60.3% (0.63 ± 0.03, 95% CI=0.55-0.66) of children younger than five years had slept under an LLIN the previous night. This findings was consistent with GDHS (2014), for which a reported proportion of 58.7% in the Eastern Region was stated. These findings were also consistent with Iwuafor et al., (2016) where 51.5% of children under the age of five years slept under an LLIN the previous night. Sleeping under an LLIN was associated with reported absence of malaria in children.

Additionally, from the multiple logistic regression, a significant relationship with absence of malaria in children and LLIN utilization were derived (AOR= 2.11, 95% CI= 1.14-3.92). Also, there existed a significant difference for homes visited and not visited by CHOs and

use of LLIN the previous night. From the X^2 analysis, there were differences from the expected and observed figures in respect to homes visited (79.0%) and homes not visited (47.2%) and utilization of LLIN. Additionally, simple logistic regression of home visit and utilization, showed a significant association for homes visited and LLIN use (COR= 4.23, 95% CI= 2.50-7.13). Homes which were visited had 4.23 the odds of sleeping under an LLIN than homes which were not visited.

5.4 Under five malaria prevalence

For malaria in children younger than five years, the study indicated that 50.7% of children had no malaria and 49.3% had malaria. This findings was not consistent with the GDHS (2014) which reported 17.8% for presence of malaria in children under five years, this might be due to the seasonality of malaria in the country. The study from the Iwuafor et al. (2016) found that 57.3% of caregivers, reported absence of malaria in children younger than five years. Also this finding by Iwuafor et al was not consistent with our finding of 50.7% malaria prevalence.

The reported 49% with fever, undertook different treatment procedures. Majority (77.1%) reported to the hospital in Kibi with 17.6% of the 77.1% giving medication like paracetamol before visiting the hospital. This was consistent with findings from Iwuafor et al (2016) study in which caregivers gave some form of medications before visiting the hospital. It is important to continuously promote the need for caregivers to take children to the nearest health facility for adequate care and management. The significant 10% who sought treatment using herbal medication indicates that relevant agencies should develop strategies to help curb the practice. There were less research findings for herbal management of malaria in the country, the Ghana Health Service recommends the use of artemisinin- based combination therapy as the first line medication for the management of uncomplicated

malaria in children.(Koram et al., 2005). The WHO in 2005 recommended the use of artemisinin-based combination therapies for the management of simple or uncomplicated malaria after confirmation by parasitological or rapid diagnostic tests.(WHO, 2005).

Generally, caregivers who were visited by CHOs were more likely to have sought treatment from a health facility compared to caregivers who were not visited by CHOs.

5.5 Conclusion

This chapter discussed the findings in relation to other findings from studies conducted elsewhere in the world. The discussion in this chapter suggests that home visit was important in addressing malaria prevalence among children under age five. Even though, home visit was important coverage was low. Hence measures should be put in place to help address the low coverage of home visits in Kibi.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary of findings

The study was to determine the influence of home visit on under five malaria prevalence in Kibi. Generally, coverage of home visit was low. However, home visit was significantly associated with reported absence of malaria. This suggest that coverage should be increased for a significant reduction in self-reported malaria. Furthermore, the recommended frequency of visit by Community Health Officers was generally low (8.3%). Thus, the recommended visit for two times a week was very low compared to once in a month (19.0%).

Most caregivers (60.3%) reported health facility visit as the most appropriate option in seeking care for malaria treatment when child under five years had malaria. Also, half of caregivers (50.7) reported presence of malaria for children under five years.

A significant proportion (65%) of caregivers identified fever in children as the cardinal sign of malaria while 55% of caregivers associated cause of malaria to the presence of plasmodium parasite and 74.7% related transmission to infective female Anopheles mosquito. On attitude related to care seeking, 75.3% reported condition of child as the proxy for seeking health care.

Also, use of LLIN the previous night had a significant association with reported absence of malaria in children. This suggest that sleeping under an LLIN was related to absence of malaria. Additionally, the educational status of caregiver was also associated with absence of malaria.

Finally, most factors related to home visit were found to be associated with reported absence of malaria in children younger than five years in Kibi.

6.2 Conclusion

The proportion of homes visited in Kibi was low compared to homes which had not received any visit from Community Health Officers. Homes which were visited had significant association with reported absence of malaria in children under the age of five years. Generally homes visited had significant differences from homes which were not visited. Frequency of home visit was also associated with reported absence of malaria. Additionally, malaria as a health topic discussed during home visit was associated with reported absence of malaria in children. Increased knowledge and ideal preventive practices in relation to malaria prevention was significantly high for homes which were visited than homes which were not. Furthermore, majority of respondents knew how malaria was transmitted. Also, a significant proportion of respondents knew the major sign of malaria for children under five. However, knowledge on cause of malaria was very low. Sleeping under an LLIN had a significant association with absence of malaria in children. The study findings showed that more children slept under the LLIN compared to those who did not sleep under the LLIN. Also, most demographic variables were not significantly associated with outcome of malaria with the exception of education and age of caregiver, which had a significant association with reported absence of malaria in children under five years. Furthermore, the proportion of caregivers with reported presence of malaria in children was low compared to absence of malaria. This could be associated with home visit and use of LLIN by caregivers.

Home visits by CHOs involve the discussion of malaria preventive practices, which includes sleeping under the LLIN and provision of LLIN to children and pregnant women. Generally, home visit was an important factor which was significantly associated with reported absence of malaria in children.

6.3 Recommendations

- The Ghana Health Service should put in place mechanisms for example incorporate components of home visit in the performance appraisal of community Health Officers to ensure the recommended number of visit are adhered to. This would ensure that the desired outcome of home visit is realized.
- Community Health Officers should emphasize on the differences between cause and transmission of malaria during home visit. Caregivers' seemly inability to correctly dissociate between the two essentials of knowledge related to malaria can be addressed by Community Health Officers through the home visit programme.
- Home visit influence on LLIN utilization for children who did not sleep under the LLIN the previous night can be achieved by increase in frequency of visits from the current once in a month to two times in a week.

6.4 Implication for Research

Further research with other health related diseases and how home visits can influence such diseases is required for a conclusive analysis on the home visit initiative. This would provide a broader view of the initiative by the Ghana Health Service. Furthermore, this is important for improvement of health for children less than five years in Kibi.

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APPENDICES

Appendix A

A. Consent Form

RESEARCH TOPIC: Influence of home visit component of Community-Based Planning and Health Services on under five malaria prevalence in Kibi

Principal Investigator: Mohammed Mutala Abilena
Email address: mamohammed@st.ug.edu.gh or mmutala59@yahoo.com

Household Number…….

Good day

My name is (Data collector) ……. You are being asked to participate in a research that seeks to assess the effect of home visit by Community Health Officers in relation to under five malaria morbidity. To take part in the study is voluntary, you may decide to be part or you may withdraw your consent to be in this study at any point in time should you feel not to continue with the study, there are no penalties associated in any such decisions you make. The essence of the research is to improve on knowledge to help inform certain policies and decisions made in the district and country as a whole for improve health indicators for all persons.

What would happen if you take part in the study?

You are being asked to participate in an interview with a trained person of the research team, the discussions will take place in a private environment or where you deem fit with minimal interruptions. The interview is made up of series of questions about your discussions with Community Health Officers who visit you and the effect it has on under five malaria morbidity. There are no wrong or right answers, the interview would last for 30 minutes. If we finish the interview, the completed questionnaire will be kept in a locking system, locked and information provided would be entered into a computer with a password that only the

principal investigator would have access to. You would not be identified in any publication or report. There shall not be any personal identification or information on the interview form.

What are the possible benefit from being in this study?

You may not benefit personally from the study. You may benefit from knowing that the information you share with us will be used to improve services rendered to you and your child at home. Caregivers in the district and the country may also benefit from the information you have given us for improve health indicators of children under-five years.

What are the possible risks or discomforts involved from being in this study?

There are minimal and psychological or social risk associated with participating in the study. Some of the uncomfortable issues would be the time you have agreed to spend with us for the interview. We would do our best to make sure you made a good decision in participating in the study as the interview would be interactive. Most importantly your name would not be attached to anything that you say. Confidentiality would be highly maintained and all information provided would be locked and sealed in a safe cabinet.

What if you have any questions?

You have the right to ask, have answers to any questions about this research. If you have questions or concerns you can kindly contact

Mr. Mohammed Mutala Abilena

MPH Student, School of Public Health, University of Ghana, P.O Box LG 25 - Legon

Tel Phone: 0240125056

E mail: mamohammed@st.ug.edu.gh or mmutala59@yahoo.com

OR

Professor Augustine Ankomah

Supervisor, School of Public Health, University of Ghana

Tel phone: 0261524407

E mail: aankomah@ug.edu.gh

Or In case of any concerns you can also contact the Ghana Health Service ethical administrator, Ms Hannah Frimpong GHS/ERC on 0243235225/ 0507041223.

Signing/thumb printing this consent form indicates your understanding of what will be expected of you and your readiness to participate in the study.

Tick at the appropriate column

Read by participant		Read by interviewer
Agreed		Refused

I have read the information provided above. I have asked all the questions I have at this time. I now voluntarily agree to participate in this research.

Name of Research Participant Date

…… ……

Signature of Research Participant Date

…….. ……..

Signature of Interviewer Date

…….. ……

Appendix B. Assent Form for participants below 18 years

Research title: Effect of home visit component of Community-Based Planning and Health Services on under five malaria morbidity in Kibi

Your child is invited to participate in a research being conducted by Mr. Mohammed Mutala Abilena a Student in Masters of Public Health, School of Public Health, University of Ghana and his assistants' investigators. The purpose of the research is to study the effect of home visit as a component of Community-Based and Health Planning Services on under five malaria morbidity of selected caregivers. He/she will be asked some questions regarding home visits by Community Health Nurses, Knowledge attitude and practices of caregivers and demographic information. There are no risks associated with this study other than the time spent with the interviewer. The benefits of the research is the knowledge gained from having participated in the study.

The questions will last for thirty (30) minutes. The participation of your ward is not compulsory as she may decide to withdraw anytime she feels like. If he/she agrees to participate, he/she can withdraw from the study at any time. Everything would be done to ensure that your ward identity would be protected as information gathered would be secured in a locking system to prevent any other access to the secured document. All completed questionnaire will be identified by a subject number such as HV01/001. Any other materials containing your wards name (e.g., consent forms) will be put in a secured locking system. After the study all documents linking your child's name to a particular subject of interest will be destroyed. His/her identity will not be revealed in any publication that may result from this study. The study is not meant to diagnose your child as malaria positive or negative.

If you have any questions please ask the interviewer. You can also contact the principal investigator, Mr. Mohammed Mutala Abilena, on 0240125056 or his supervisor,

Professor. Augustine Ankomah on 0269083789 for further information. Declaration by parent/guardian

I have read this consent form and know that I may ask questions now and any time. I have also be given a copy of the consent form for my records. I consent for my child to participate in the research described above.

Name of the child: ……..

Date of interview: ……

Signed/Thumbprint: …….

(Parent/Guardian of participant)

Appendix C. QUESTIONNAIRE

RESEARCH TOPIC: Effect of home visit component of Community-Based Planning and Health Services on under five malaria morbidity in Kibi

Principal Investigator: Mohammed Mutala Abilena
Email address: mamohammed@st.ug.edu.gh or mmutala59@yahoo.com
Supervisor: Professor Augustine Ankomah
E mail: aankomah@ug.edu.gh

Household Number…….

Good day

My name is (Data collector) ……. You are being asked to participate in a research that seeks to assess the effect of home visit by Community Health Officers in relation to under five malaria morbidity. To take part in the study is voluntary, you may decide to be part or you may withdraw your consent to be in this study at any point in time should you feel not to continue with the study, there are no penalties associated in any such decisions you make. The essence of the research is to improve on knowledge to help inform certain policies and decisions made in the district and country as a whole for improve health indicators for all persons.

SOCIO DEMOGRAPHIC CHARACTERISTICS- MARK THE APPROPRIATE OPTION		
NO	QUESTIONS	RESPONSE
1	How old is the caregiver as at last birth day	…….. years
2	How old is child aged 0-59 in completed months	……. Completed months
3	What is the sex of Caregiver	a. Male……..0 b. Female……...1
4	What is the Sex of Child (0-59months)	a. Male……0 b. Female……1
5	What is caregiver current marital status	a. Single ……0 b. Married……1 c. Co-habitation……2 d. Divorced…… .3 e. Widow……..4
6	What is caregivers educational status	a. Never attended school ..0 b. Primary……..1 c. Secondary……. 2 d. Tertiary……. 3
7	Religion of Caregiver	a. Islam ……..0 b. Christianity……1 c. Traditional …… …2 d. Others …… …3

8	Are you currently employed	a. No ……..... 0 b. Yes……..1
9	What is caregivers current Occupational Status	a. Business……0 b. Farmer…… .1 c. Student…….2 d. Professional……..3

HOME VISIT BY COMMUNITY HEALTH OFFICERS		
10	Do you know of a Community Health Officer who visit homes in Kibi for health discussions with caregivers	a. No……. ……0 b. Yes……1
11	Have a CHO ever visited you at Home in the past 6 months	a. No……. ……0 b. Yes……1 **If Yes move to question 12**
12	How many times did the CHO visit you and your child in the past 6 months	a. Once weekly……..0 b. Two times weekly……..1 c. Three times weekly……....2 d. Once in a month…….3 e. Does not visit…….4 f. Others……5
13	How long did the CHO spend with you during your discussions	a. < 30 minutes……0 b. >30minutes…….....1 c. >= 1hour……...2
14	What were the areas of discussion between the CHO and the caregiver	a. Diarrhoea ……0 b. Malaria……1 c. Respiratory diseases…….2 d. Other diseases……...3 e. Do not know…….4
15	Did the CHO discuss any malaria issues with you during her visit	a. No……0 b. Yes……1 c. Don't know……...2
16	What were the areas of discussion on Malaria	a. Causes of malaria……..0 b. Prevention of malaria…… …1 c. Treatment of malaria……..2 d. Health seeking behavior…….3 e. LLIN acquisition…….4 f. Others……..5
17	Did you agree with the CHO on when he/she can follow up on agreed practices	a. No……0 b. Yes……1 c. Do not know…….2
18	Did the scheduled follow up occur	a. No…….....0 b. Yes……1 c. Don't Know……..3

19	Was the CHO satisfied with the progress of agreed practices	a. No……0 b. Yes……1 c. Do not know……2
KNOWLEDGE ATTITUDE AND PRACTICES OF CAREGIVERS IN RELATION TO MALARIA		
20	What are the important diseases in Kibi that affects children under five	a. Diarrhoea ……...0 b. Malaria……1 c. Respiratory diseases……2 d. Skin infections……3 e. Other disease……...4 f. Do not know……5
21	Have you heard of Malaria	a. No……0 b. Yes……1 **If no move to question 26**
22	Where did you hear of malaria	a. Hospital…….……0 b. Home visits by nurses……1 c. Radio……..2 d. I suffered from …….....3 e. Health durbars……....4 f. Others……5
23	What is the major sign of malaria in children under five years	**Tick only one option** a. Headache……..0 b. Fever……1 c. Dizziness……...3 d. Loss of appetite……4 e. Convulsion……5 f. Lethargic……6 g. Vomiting……7 h. Weakness…… ….8 i. Other……. … ……9 j. Do not know…….....10
24	What major cause malaria in children under five	**Tick only one option** a. Germs……....0 b. Plasmodium parasite……1 c. Bushy environment……...2 d. Weakness……...3 e. Bite of infective female anopheles mosquito……....4 f. Dirty environment……..5 g. Do not know……...6
25	How is malaria transmitted in your community	a. Plasmodium parasite……0 b. Through the bite of infective female anopheles mosquito….....1 c. Dirt/stagnant water…… ..2 d. Bushy environment……3 e. Weakness…… ..4 f. Plasmodium parasite……..5 g. Don't Know……6

25	When your child gets malaria what do you do	a. Provide home base treatment for the child……..0 b. Take child to the hospital……..1 c. Do not give any medication and takes the child to the clinic for the treatment…….2 d. Takes the child to the herbalist for treatment…….3 e. Give artimicinin-based combination therapy…….....4 f. Others…….....5
26	What is the most important factor you consider when deciding to seek care for the child under five	a. Perceived cost……0 b. Condition of child…… …..1 c. Attitude of nurses at the clinic…3 d. Time of day Sickness started…..4 e. Best treatment for malaria……..5 f. Other…….....6
27	How do you prevent mosquitoes from biting the under-five child	**Allow for multiple answers** a. Cleaning the Surroundings……0 b. Sleeping under LLINs……1 c. Using insecticide……2 d. Giving medications regularly…..3 e. Others……..4
28	Does your household have any mosquito nets that can be used while sleeping?	a. Yes……...0 b. No……1 c. Don't know……..2
29	How many mosquito nets does your household have?	a. 0……0 b. 1-3……1 c. >3……2
30	How many months ago did your household get the mosquito net	a. >6 months……...0 b. <6 months…… ..1 c. >6 months……...2 d. Don't know…….....3
31	Where did you get this net	a. During the hang up campaign.…0 b. Child welfare clinic……1 c. Antenatal services……...2 d. Household distribution with use of coupons……3 e. During the hang-up campaigns…..4 f. Others……5
32	When you got the net, was it already treated with an insecticide to kill or repel mosquitoes	a. No…….....0 b. Yes……1 c. Don't Know……..2
33	Did anyone sleep under this mosquito net last night?	a. No…….....0 b. Yes……1 c. Don't Know……..2

34	Who slept under this mosquito net last night?	**Indicate yes if index child slept under the net last night** a. No…….....0 b. Yes……1 c. Don't Know……...3
35	How often does the index child under five sleep under the LLIN	a. Never……..0 b. Always……1 c. Never……...2

MALARIA MORBIDITY		
36	Has your child had malaria in the past two weeks or after the home visit by the Community Health Officer	a. No……..0 b. Yes……1 c. Don't Know…2
37	If yes, number of episodes of malaria	……..
38	How many times have you visited the health facility to seek care for the child under five in the past six month or following the visit made by the Community Health Officer	……..

END

Appendix D. Operational definition of variables

Variable	Type of variable	Operational definition	Scale of Measurement	Objective
Demographic variables				
Age of caregiver	Independent	Age at last birthday of caregiver as at time of interview	Interval	Not Applicable
Age of child	Independent	Number of completed months of child as at time of interview	Interval	Not Applicable
Sex of caregiver	Independent	Male or female caregiver	Nominal	Not Applicable
Sex of child	Independent	Male or female child	Nominal	Not Applicable
Educational status of caregiver	Independent	Highest level of education attained by caregiver as at time of interview	Ordinal	Not Applicable
Religion	Independent	Religion of caregiver as at time of interview	Nominal	Not Applicable
Occupation	Independent	Occupation of caregiver as at time of interview	Nominal	Not Applicable
Home visit Variables				
Home visit	Independent	Ever being visited by a CHO or nurse for under five health related discussions as at time of interview	Binary	1&3

Frequency of visit	Independent	Number of times visit took place as at time of interview	Ordinal	1
Duration of visit	Independent	Length of time spent during the visit by a CHO	Ordinal	1
Follow up visit	Independent	Scheduled follow up of visit after the initial visit as at time of interview	Nominal	1
Occurrence of follow up visit	Independent	whether the scheduled follow up visit took place	Nominal	
Topics discussed during visit	Independent	Health related issues discussed during the visit by a CHO as at time of interview	Nominal	1
Awareness, knowledge, and practices about malaria				
Awareness on malaria	Independent variable	Respondents awareness on malaria as at time of interview	Binary	2
Place of awareness	Independent	Source of awareness by caregiver	Nominal	2
Priority of diseases	Independent	Respondent view on which disease that affects children under age five and is important for intervention in Kibi	Nominal	2
Knowledge on major sign of malaria in	Independent	Respondent knowledge on the most important sign of malaria in children under age 5	Ordinal	2

children under five		(fever with axillary temperature > 37.5)		
Knowledge on major cause of malaria	Independent	Respondent knowledge on the most important cause of malaria in children under age five	Ordinal	2
Knowledge on transmission of malaria in children younger than five years	Independent	Knowledge on how malaria was transmitted in children younger than five years	Ordinal	2
Attitude about malaria	Independent	Respondents care seeking options for children with or without malaria at the time of interview	Nominal	2
Practices of malaria	Independent	Caregivers response on sleeping under LLIN the previous night as at the time of interview	Binary	2
Availability of LLIN	Independent	Presence or absence of LLIN in the house as at the time of interview	Binary	2
Quantity of LLIN available		Number of LLIN available as at time of study	Ordinal	2
Place of acquisition	Independent	Place where caregivers obtained an LLIN as at time of interview	Nominal	2

Under five malaria prevalence				
Malaria in under five	Dependent	Caregivers response to malaria either present or absent in the preceding two weeks of the study	Binary	3
Treatment of malaria	Independent	Responses on how malaria was managed	Ordinal	3

Appendix E. TIMELINES

NO	ACTIVITY	PERIOD
1	Research proposal development	September-November 2016
2	Finalizing of research topic, Introduction of study, study objectives, problem statement, literature review and methodology	September- November 2016
3	Presentation of finalized proposal for ethical clearance to the Ghana Health Service- Ethical Review Committee for approval before conducting the research work	November 2016- April 2017
4	Collecting data for research	May- June 2017
5	Correction of errors and checking of completeness of questionnaire	May - June 2017
6	Coding of data and data entry processes	May – June 2017
7	Presenting results, discussions and recommendations together with appropriate referencing using APA	June 2017
8	Multiple reading to identify errors and finalize thesis for presentation	June – July 2017
9	Editing of thesis and final presentation for Supervisor's approval	June- July 2017
10	Presentation to department and School of Public Health	July 2017

Appendix F. BUDGET JUSTIFICATION

PERSONNEL

Mr. Mohammed_Mutala Abilena (MPH Student) was responsible for the entire research, which includes: coordination, implementation, supervision, recruitment of participants, training, provision of logistics and other materials for the successful implementation of the research. Supervision of research assistants was an integral component of the study.

Professor Augustine Ankomah (Supervisor) was responsible for the final evaluation of the research and subsequent grading of the work. Other personnel included a staff from the Municipal Health Directorate with the responsibility of coordinating the submission of completed questionnaire for entry into the excel sheet of PI's computer.

LOGISTICS AND TRAINING PROCESS

Funds was required for social mobilization processes. Meetings were organized for various stakeholders, including the Municipal Health Management Team (MHMT) and core staff of the Municipal Assembly in East Akim Municipality for purpose of introducing the study and how the study would influence health indicators especially under five morbidity for the locality.

Training was held for ten (10) research assistants and two officials from the Municipal Health Directorate spanning a period of two (2) days in Kibi. Renting of a conference room for the training was at a cost of GHC 100.00. During the training, lunch and snacks were provided for participants and at the end of the training transport allowance was given to participants at a total cost of GHC 720.00 for all participants and supporting staff from the Health Directorate. During data collection per diem was provided for research assistants

together with transport allowance in a bid to convey participants to designated locations for the purpose of the research.

Processing of data obtained from the community was done with a laptop computer which was procured at a cost of GHC 2000. Communication and financial support for data entry officers were vital for the study and therefore was provided for officers responsible for these activities.

The final report of the study was binded and submitted to the Graduate school of the University of Ghana through the School of Public Health. Five copies of the report was binded at a cost of GHC 100 each.

Completion of the study did not end by submission of binded copies to the School. There was a dissemination meeting for key stakeholders such as the Municipal Assembly and the Health Directorate to communicate findings of the research for action by leaders of the institutions. The cost associated with the meeting was GHC 655 which included stationery, snacks and water.

Appendix G BUDGET SUMMARY

NO	ACTIVITY	ITEM DESCRIPTION	UNIT COST GHC	FREQUENCY	TOTAL COST GHC
1	Community Entry Processes and Social Mobilization	Stationery	5.00	5	25.00
		Snacks	5.00	5	25.00
		Transportation	10.00	10	100.00
	Sub total				150.00
2	Training of Research Assistants	Conference Hall	100.00	2	200.00
		Stationery	5.00	10	50.00
		Snacks	7	12*2	168.00
		Lunch	15	12*2	360
		Fuel for errands	3.66	45 liters	164.70
		Transportation	30.00	12*2	720.00
	Sub total				1762.70
3	Data collection	Transportation	30	10*5	1500.00
		Fuel for errands	3.66	60litres*3	658.20
		Per diem for Research assistants	50	10*5	2500.00
	Sub total				4658.20
4	Process of data, analysis and report writing	Laptop	2000.00	1	2000.00
		Communication	10.00	5	50.00
		Stationery	50.00	5	250.00
		Per diem for data entry Officers	50.00	5*5	1250
	Sub total				3550.00
	Binding and Final presentation of Thesis	Binding of thesis	100.00	5	500.00
	Sub total				500
	Dissemination of findings to stakeholders	Conference Hall	100	1*1	100.00
		Snacks	7.00	15*1	105.00
		Transportation of participants	30	15*1	450.00
	Sub Total				655.00
GRAND TOTAL					**11175.90**