SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA

MALARIA TREATMENT-SEEKING BEHAVIOUR AMONG CAREGIVERS OF CHILDREN UNDER FIVE YEARS IN THE NKWANTA DISTRICT.

BY

PAMELA EYRAM OFORI- KUMA

A DISSERTATION SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF GHANA, LEGON, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTERS DEGREE IN PUBLIC HEALTH

AUGUST, 2008

DECLARATION

I declare that except for references of other people's investigations which have been duly acknowledged, this dissertation is the result of my own original research and that this dissertation either in whole or in part has not been presented for another degree elsewhere.

AUTHOR

.....

PAMELA EYRAM OFORI- KUMA

RESIDENT

ACADEMIC SUPERVISORS

.....

DR. MAWULI DZODZOMENYO

PRIMARY SUPERVISOR

.....

DR. COLLINS AHORLU

SECONDARY SUPERVISOR

DEDICATION

I dedicate this dissertation to my father Mr. Reubenson Aikins Ofori- kuma.

ACKNOWLEDGEMENT

First, I thank God Almighty for the opportunities He has given to me in life including this MPH course.

I am grateful to my academic supervisors, Dr. Mawuli Dzodzomenyo and Dr. Collins K. Ahorlu and my field supervisor, Dr. Emmanuel Kasu for their supervision and input. I also appreciate the efforts of Dr. Moses Aikins and all my lectures for imparting knowledge to me throughout the MPH course.

I would also like to thank my parents and siblings for all kinds of support they gave me throughout this year.

I thank all the DHMT members at Nkwanta for their help and making my stay in the district a memorable one.

To Minister Daniel Nettey, MPH colleagues and all my friends for their immense support and encouragement, I say thank you and God bless you.

ABSTRACT

The malaria menace continues to claim the lives of children. More than a third of children under five die before the first month of life. In any malaria control programme, treatment seeking behaviour of caregivers acting in synergy with other factors such as socio-cultural factors, economic and health system factors has been identified as contributing significantly to the survival of children. They contribute directly or indirectly to the high morbidity and mortality rate in children under five years. This study is therefore aimed at determining the knowledge of caregivers on causes and symptoms of malaria, to identify the treatment options and factors influencing caregivers' treatment seeking behaviour in the Nkwanta district as well as their treatment practices.

A multi-stage cluster sampling method was used in selecting caregivers. Three sub-districts were selected purposively taking their geographical locations into consideration. Four hundred caregivers from the three sub-districts were interviewed. Both quantitative and qualitative methods of data collection were used using structured questionnaires and focus group discussion guides. Data was analysed using SPSS version 11.5 and EpiInfo version 3.3.2 software for the quantitative data and the qualitative data was analysed manually after transcription. Results showed that caregivers' knowledge on malaria was low and was affected by their level of education. Caregivers used multiple methods of treatment for their children. Their first point of call for treatment was the hospital (71.4%) and pharmacy (26.9%). Delay at home, distance to and time spent at the treatment source ($P<0.05$) was seen to influence caregivers' treatment seeking behaviour. Caregivers use artesunate amodiaquine to treat their children. Others used chloroquine

and artesunate monotherapy. Concoctions or herbal preparations were also used by a few caregivers. About 20% of the caregivers sought treatment within 24 hours of the onset of malaria. Educating caregivers on the importance of seeking early and appropriate treatment for their children is necessary. Intensifying the home-based care strategy by WHO to cover the whole district would also improve the treatment-seeking behaviour of caregivers in the district especially within 24 hours of the onset of illness. Chemical sellers should also be educated or occasionally trained on the use of ACT to treat uncomplicated malaria in children under five years. The continuous use of chloroquine and artesunate monotherapy can be detrimental to the success of Ghana's new drug policy to treat uncomplicated malaria. The National Malaria Control Program in collaboration with the MOH/GHS should put strategies in place to ensure that chloroquine is removed from all health centres and chemical stores/pharmacy within the country.

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LIST OF ABBREVIATIONS

IPT	Intermittent Preventive Treatment
NMCP	National Malaria Control Programme
ITN	Insecticide Treated Nets
ACT	Artemisinin-based Combination Therapy
SP	Sulfadoxine pyrimethamine
GHS	Ghana Health Service
OPD	Out Patient Department
RBM	Roll Back Malaria
FGD	Focus Group Discussion
GEMI	Ghana Essential Medicines Initiative
ENHANCE	Expanding Nutrition and Health Achievement through Necessary Commodities and Education
AS/AQ	Artesunate Amodiaquine
WHO	World Health Organisation
CHPS	Community-based Health Planning Services
DHMT	District Health Management Team
UNICEF	United Nations International Children's Educational Fund
MOH	Ministry of Health

DEFINITION OF TERMS

1. Caregiver is any individual who feeds, clothes, sees to the daily well-being of the child including taking the child for treatment when in a morbid state.

2. Knowledge of malaria is the ability of the caregiver to identify signs and symptoms of malaria as well as the causes of the disease.

3. Perception of malaria refers to respondents own view on malaria.

4. A child under five years in this study refers to any child between the ages of six months and fifty nine months.

5. Treatment seeking behaviour is any action that a caregiver takes to get help or treat a child during a malaria episode.

6. Practices of caregivers is how caregivers administer the drugs to their children and other activities that may be performed on the child under five years with malaria apart from given them the drugs.

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND

1.1.1 Global burden of malaria

The number of malaria deaths in the world has been estimated at 1.1 to 1.3 million in the World Health Reports 1999 to 2004 and its incidence in 2004 was between 350 to 500 million cases. While malaria contributed 2.05% to the total global deaths in 2000, it was responsible for 9.0% of all deaths in Africa (WHO Report, 2002). About 90% of the world's malaria deaths are estimated to occur in tropical Africa (Ruxin et al, 2005). It is also considered to be endemic in 107 countries (WHO Roll Back Malaria, 2005). In malaria endemic countries, it forms 25 to 40% of outpatient visits and 20-50% of hospital admissions, imposing a great burden on the health care system (Africa Malaria Report, 2003).

1.1.2 Malaria burden in Africa

Malaria kills one child every 30 seconds, about 3000 children every day and more than one million people die each year in Africa (UNICEF Report, 2007). Approximately twenty thousand children die of malaria every year in Ghana and 25% of them are in children under five (UNICEF Report, 2007). More than one-third of children under five die from malaria before the first month of life usually at home and without access to health care that might save their lives (Chea-Annan, 2008). Children under five years and pregnant women are the most vulnerable in sub-Saharan Africa. It is endemic in most countries in this region where the majority of infections are caused by the most dangerous

of the species *Plasmodium falciparum*. In spite of the varying interventions that have been put in place to combat the menace, it still remains the leading cause of morbidity and mortality especially in children under five years in sub-Saharan Africa and Ghana (World Malaria Report, 2005).

1.1.3 Malaria burden and control efforts in Ghana.

Malaria remains one of the major reasons for low productivity and poverty level in the country. It accounts for 45% of all outpatient attendance and 12% of under five mortality (National Malaria Control Programme, 2007). Two percent of children who recover from cerebral malaria suffer brain damage and epilepsy (Asante and Asenso-Okyere, 2003). Ghana strives as other African countries to achieve the target of becoming a malaria-free country. In the year 2005, the National Malaria Control Program (NMCP) up-scaled intermittent preventive treatment (IPT) strategy from 20 initial districts to all 138 districts in the country for pregnant women. It also promoted the use of insecticide treated nets (ITN) by children under five years and pregnant women and adopted a new policy to replace Chloroquine with artemisinin-based combination therapies (ACT) to manage malaria and sulfadoxine-pyrimethamine (SP) to prevent malaria in pregnancy. Ghana has over the years made some progress, though relatively slow yet significant. Fatalities in children under five dropped by 38% from 3.26/100 in 2003 to 2/100 in 2005. In 2005, 48.6% of mothers improved their treatment seeking behaviour for malaria in their children compared to 22% in 2003 (National Malaria Control Programme, 2007). Nkwanta district is not spared of this disease. It forms about 26% of all hospital

admissions, 41% of outpatient (OPD) attendance, of which 36.6% occurred in children under five years in the year 2005 (Nkwanta Annual Report, 2006).

1.1.4 Effects of malaria

The burden of malaria is a concern to households, communities, nations and to the world. It is therefore a problem which requires all and sundry to eradicate. Apart from the high mortality worldwide, disabilities also occur if not treated properly. Young children with frequent episodes of malaria may suffer learning disabilities which may affect their educational attainment. Malaria causes absenteeism in school-going children reaching as high as 28% in some areas and lost workdays in working adults (WHO Roll Back Malaria, 2005). In the light of this, human capital which is a major contributor to economic development is threatened. The cost of malaria to families and on nations is relatively high since most of the endemic countries are poor (Ghana Malaria Advocacy Guide, 2007). Several factors including poor living conditions, increase in drug resistance, association between malaria and HIV/AIDS, climate and environmental change, inadequate interventions and control strategies may be some reasons for the high mortalities still being recorded in the African sub-region (Adams et al, 2004).

1.1.5 Vectors and causative agents

The female *Anopheles* mosquito transmits the malaria parasite. Two main Anopheline species are known to transmit malaria in Ghana-the *Anopheles funestus* that breeds all year round in permanent waters such as along streams, rivers and lakes and the *Anopheles*

gambiae which breeds in temporal, shallow, sunlit clear waters such as ponds, pot holes, dugout pits and rice fields. *Anopheles gambiae* becomes more pronounced after rains but have been found lately to breed in gutters during the dry season (Baffoe-Wilmot, 2008). *Plasmodium falciparium, P. vivax, P. malariae and P. ovale* are the four human parasites that cause malaria. In Ghana, the *P. falciparum* (80-90%), *P. malariae* (20-36%) and *P. ovale* (0.15%) are present (Ghana Malaria Advocacy Guide, 2007). *Plasmodium falciparum* however is the commonest and most dangerous causing about 95% of all malaria cases in our health facilities (Ghana Malaria Advocacy Guide, 2007).

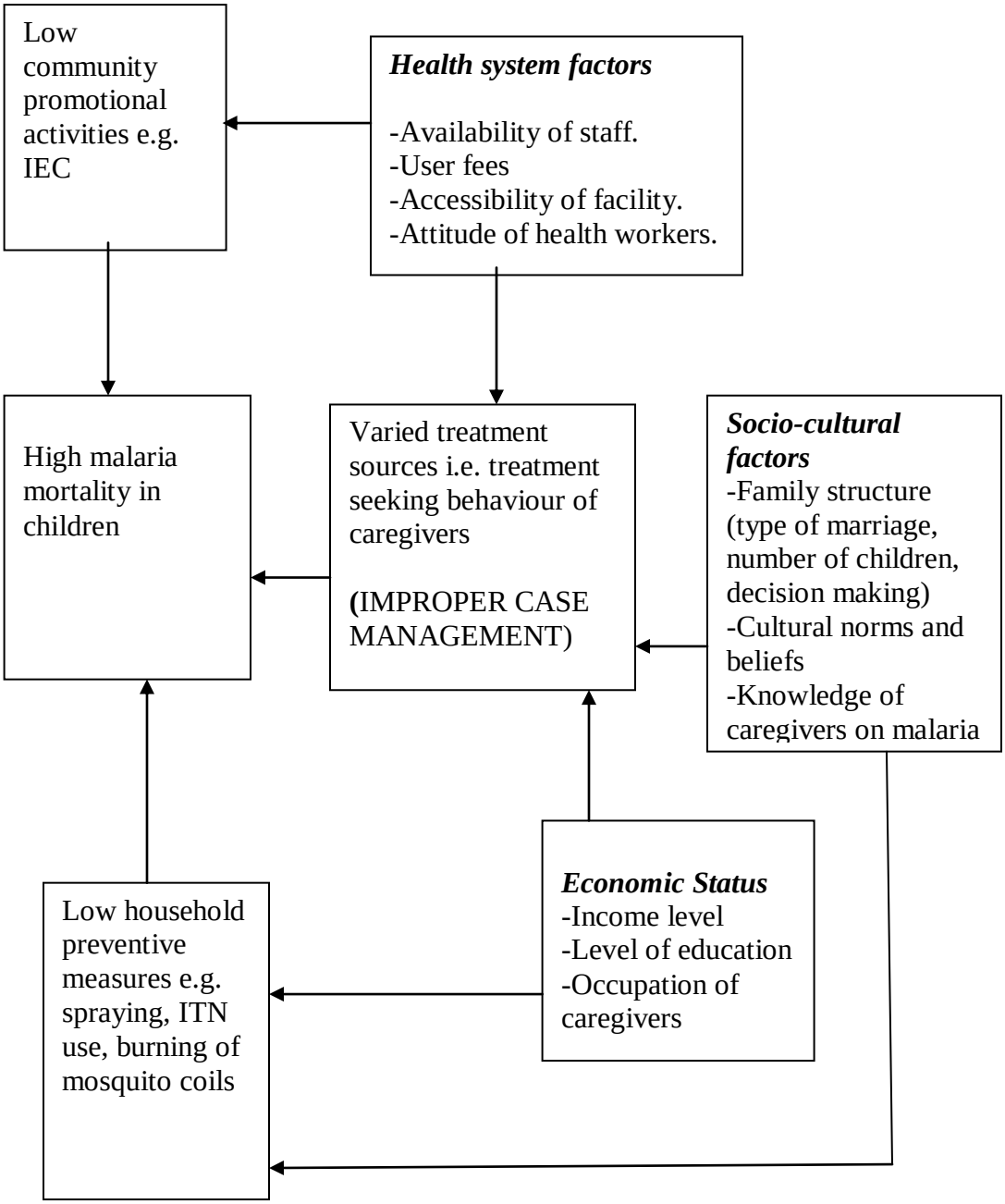
1.2 Problem Statement

Malaria is a disease that affects both adults and children. In spite of the varying interventions that have been put in place to fight the menace, it still remains the leading cause of morbidity and mortality especially in children under five years in sub-Saharan Africa including Ghana (UNICEF and RBM, 2007).

Prompt and effective treatment is one of the cornerstones of any malaria control strategy. However, it is widely known that caregivers use multiple treatment approaches some of which are detrimental to the children who have malaria. Identifying symptoms of malaria and seeking appropriate treatment is therefore a challenge for many caregivers because of their level of formal education, knowledge of malaria and their socio-economic status. Some of the common practices include visiting the pharmacy/chemical shops, the herbalists, faith healers, hospital or self treatment of children at home. The health facility, where clinical and laboratory confirmatory diagnosis can be performed, are mostly the last point of call for caregivers with a morbid child. This practice leads to delay in

seeking prompt and appropriate treatment for children and further increasing their risk of dying (Malik et al, 2006). Reliance on other treatment options results in delay in seeking health care for their children. Delay is further compounded by socio-cultural factors (belief system and attitude), economic factors (income level, marital status), availability of health facilities and its distance from the households and knowledge of caregivers on malaria (signs and symptoms). The behaviour of caregivers to choose the hospital as the last point of call for treating their children of malaria must be critically considered if Ghana intends to achieve the goals of the Roll Back Malaria (RBM) initiative whose agenda is to halve the burden of malaria by 2010 and the Abuja targets which states that 60% of those suffering from malaria should have access to and be able to use correct, affordable, and appropriate treatment within 24 hours of the onset of symptoms, increase coverage of insecticide treated bed nets (ITN) to 60% in pregnant women and in children under five years of age and reduce mortality in children to 40% by 2005 (Africa Malaria Report, 2003). It is in this regard that international agencies such as WHO have adopted a home-based care management approach to encourage mothers to treat their sick children promptly with appropriate drugs within 24 hours of the onset of malaria symptoms. Nkwanta has been chosen for this study because of the number of ethnic groups present, its remoteness and nature of the road network system making accessibility to health care facilities more difficult.

1.3 CONCEPTUAL FRAMEWORK



1.4 Justification:

Malaria remains a threat to the survival of children under five years. A multi-prong approach in solving this problem is deemed best. Attempts at its control involve education on proper and effective treatment approaches. Behaviour patterns have been identified as key in choice of treatment. The findings of this study therefore will add to the world of knowledge on malaria treatment in children under five years in Ghana and would reveal some of the reasons for the high mortality in children under five years since it formed 41% of OPD attendance of which 36.6% occurred in children under five years in the year 2005 in Nkwanta. It would further inform the Nkwanta district directorate of targeting new interventions or strengthening existing ones to improve on the health of children. It will also serve as the foundation for the promotion of educational programmes on the recognition of symptoms and proper use of anti-malarial drugs for children under five years, a strategy to improve home-based care in the district. In addition, Ghana has recently replaced chloroquine with artesunate and amodiaquine combination for the treatment of simple malaria. This study will additionally reveal the level of acceptance or compliance to this policy by caregivers, after the initial problems with its implementation.

1.5 OBJECTIVES

1.5.1 General objectives:

- To determine malaria treatment-seeking behaviour among caregivers of children under five years in the Nkwanta district.

1.5.2 Specific objectives

- To determine the knowledge and perception of caregivers on the causes of malaria.
- To determine the treatment options of caregivers in the district.
- To determine the factors that influences the choice of treatment options by caregivers.
- To describe the treatment practices of caregivers in treating malaria in children under five years.

CHAPTER TWO

2.0 LITERATURE REVIEW

Malaria has raised utmost concern in people from all walks of life. Therefore, a lot of research has been done and is on-going to ultimately reduce the morbidity and mortality rates. Intervention and non intervention studies have been employed to explore the options for new treatment, preventive measures as well as promotion of healthy living to reduce transmission.

2.1 Knowledge and perception on cause of malaria

2.1.1 Cause and symptoms of malaria

To reduce mortality in children less than five years, care providers need to know what the causes and clinical signs and symptoms of the disease are. Recognising that a child under five years has malaria is a key factor and a major step to helping reduce the mortality in children due to malaria. The results of a cross-sectional study carried out in the Sudan showed that, of the 96 mothers who brought their children to health facilities, 58.3% of them were illiterate yet they were able to recognise malaria from the symptoms and seek treatment (Malik et al, 2006). Fever or 'hot body' was normally used to recognise malaria. The study however did not report what the mothers thought caused it yet the results reflected a high level of knowledge about malaria.

In the Philippines, local knowledge was influenced by clinical diagnosis but focus group discussions held showed that the endemicity of the disease had had an effect on them such that they perceived malaria as a disease that could occur at any time. People had a mixed concept of the aetiology of malaria including both organic (germ) and inorganic (weather changes). Respondents in the same study stated that it was caused by a mosquito

bite, drinking polluted water, food contaminated with flies and sudden changes in the weather-a mixture of beliefs from both environmental and hygiene conditions (Miguel et al, 1998; Sanjana et al, 2006; Espino et al, 1997). Other studies in Sudan, Burkina Faso and Ghana showed that respondents stated the same causes of malaria as well as worm infestation, personal hygiene and heat from the sun (Okrah et al, 2002; Malik et al, 2006; Ahorlu et al, 2006). Mothers in a study in Tanzania also reported clearly that mosquito bites did cause the disease but spiritual causes of malaria were not ruled out (Makundi et al, 2006, Warsame et al, 2007). According to Comoro (2003), mothers also suggested that urinating on the child or fuming them with elephant dung were effective cures for convulsions, a complication of malaria, since injections were considered fatal for this condition. In Nigeria, the knowledge on malaria treatment was realised to be generally poor but was seen to be better in the urban area when compared to a rural area in other studies (Oreagba et al, 2004, Oguonu et al, 2005). Majority of respondents in both the central (92.9%) and eastern regions of Ghana (97.3%) identified mosquito as the cause of malaria and nearly 70% of respondents in both regions named fever and chills as a symptom (De La Cruz et al, 2006; Njama et al, 2003). Though knowledge of malaria was generally poor, it was significantly higher in the older, educated and skilled mothers in Nigeria (Fawole and Onadeka, 2001). Other causes mentioned by respondents of various studies were convulsions, vomiting, anaemia, yellowish urine, refusal of food/loss of appetite, joint pains and illness, jaundice (Ahorlu et al, 2006; Okrah et al, 2002).The most common malaria symptoms were fever and chills in an endemic area in Turkey forming 78.6% of the response from caregivers (Simsek and Kurcer, 2005). In that study, none of the respondents knew how mosquitoes acquired the parasite. In The Gambia, only 28% of

the respondents knew that mosquitoes transmitted malaria but 90% of them knew that malaria transmission occurred in August and October (Aikins et al, 1993). A comparative study of five African countries showed that 50% of people in Ghana, Sierra Leone and Guinea Bissau were aware that mosquitoes caused malaria and 25% in The Gambia but heavy rains and cold weather were also linked to causes in Ghana and Guinea Bissau. Stepping in goat urine was also linked as a cause of malaria in Senegal, eating seasonal foods excessively and an act of God were stated by respondents in The Gambia (Aikins et al, 1994).

2.1.2 Perception of malaria

The perception of a disease is related to a person's socio-cultural reality i.e. their social role and expected behaviour to shape both behaviour and ability to respond to disease (Okafor and Amzat, 2007). A study in Uganda by Nuwaha (2002) reported that the people perceived convulsions as a supernatural ailment best treated by traditional medicine. In 2005, some pregnant women in rural Uganda reported that the local name for malaria was "omusujja" and was perceived to be the most common disease of pregnant women thus a normal sign of pregnancy and primigravidae, men and adolescents were not considered at risk of "omusujja" (Mbonye et al, 2006). The cause of malaria in Tanzania was believed to be of evil spirits (Savigny et al, 2004; Comoro, 2003). The local name for convulsion in Tanzania was "degedege", which is a complication of malaria, and is perceived as a serious life-threatening condition that must be treated promptly. One of the respondents in that study said,

> "....*Evil spirits or demons cause degedege. If it happens that evil spirits or demons pass in front of the child, then the child is likely to get degedege. This may result in paralysis of the body or leg or arm or any part of the body..."* (Male respondent aged 46, from Kilimani, Rufiji)."

Among the Dangme people of Ghana "Atridi", "Asra", "Nudza", and "Edun" denoted fever and Asraku denotes high fever (Ahorlu et al, 1997). Another concept among the Dangme in Ghana is the *hiorwe* referring to sky illness which is characterised by convulsions (Ahorlu et al, 1997). In rural Burkina Faso, *sumaya, dusukun yelema, kono and djoliban* were local concepts resembling uncomplicated malaria, respiratory distress syndrome, cerebral malaria and severe malaria respectively. The local concept of malaria had an influence on health seeking behaviour and the type of treatment a child received (Beiersmann et al, 2007). In the Gambia, malaria had no specific name but was referred to as Fula kajewo (Fula fever) and most people (90%) believed that August to October were the main malaria seasons (Aikins et al, 1993).

2.2 Treatment-seeking behaviour and practices

A study done in southern Ghana by Ahorlu et al (2006) reported that about 89% of the caregivers sought treatment at the Government Hospital or Community Clinic. However, only 11% and 33% went to those providers within 24 and 48 hours respectively. Sixty-seven percent of caregivers interviewed purchased drugs from various licensed and unlicensed sellers for their children out of which 9.2% sought appropriate treatment within 24 hours and 29.4% within 48 hours. Another study in the northern part of Ghana showed that 28.4% of the people preferred home-based care, 20.8% used traditional sources, 19.1% resorted to health clinics, 18.4% to drug shop and 13.2% sought hospital

care for their children (Akazili et al, 2007). Malaria treatment was often reported to be a combination of modern and traditional methods depending on the type of malaria and the perceived severity of the disease by the caregiver in a work done by Okrah et al (2002). A report of a review of literature suggested that most malaria episodes usually began with self-treatment and close to half of the cases rely exclusively on self-treatment with anti-malarial administration. Though traditional remedies are often combined with modern medicine, exclusive reliance on traditional methods is rare and more than half of the caregivers use the health workers at some point but after three days or more (McCombie, 1999). A study in Uganda showed that 67% sought treatment at private practitioners/pharmacists which is different from studies done in Kenya, Mali and Ghana though some self treated and used traditional medicine (Nuwaha, 2002). A study in Kenya showed that the health centres (18%) and treatment at home with herbal remedies or drugs bought at the drug shop (60%) were the two main places where they sought care and 22% sought no treatment at all for their children. It is perceived by the respondents as a disease less severe than AIDS (Ruebush et al, 1995). Treatment-seeking behaviour is thus influenced by the local perception of the disease-the cause and severity of the case (Miguel et al, 1998). In an endemic rural area in Turkey, only 21% of the respondents would seek treatment from physicians or a malaria unit and 55% of the respondents reported protective behaviours that were not directly associated with malaria transmission (Simsek and Kurcer, 2005). Savigny (2004) reported that 78.7% of mothers sought care in modern facilities, 9.4% used traditional and 11.9% sought no care of any kind. There was no difference in pattern of choice of sex of the child, sex of the head of the household, socio economic status of the household or presence or absence of convulsion.

2.2.1 Factors affecting treatment seeking behaviour of caregivers

Apart from the local perception that people have on malaria, accessibility to clinics is normally a problem. This was however not the case for the people in Philippines, where the primary reason for the delay was their propensity to self-treat first and then discontinue medication when the child is feeling better. The availability of the health centre and their belief in traditional medicine were some factors identified to influence treatment choice of Sudanese women (Malik *et al*., 2006). They thus treat their children until their condition deteriorated. According to Thera et al (2000), 75.8% of the caregivers treated at home during the rainy seasons and they also perceive malaria as a simple disease that can be handled at home suggesting that seasonal patterns can influence the treatment behaviour of caregivers.

Malik et al (2006), Taffa and Chepngeno (2005) highlighted some reasons such as cost of treatment, knowledge of the correct treatment, lack of authorization from the father and according to Munthali (2005), long distance to facility, presence of drugs at home and unavailability of drugs at the health centre were reasons why they didn't patronize the health centre. In rural Burkina Faso, disease severity and accessibility were associated with treatment-seeking in a hospital or health centre (Muller et al, 2003). Another report on caregivers in Kenya stated that home treatment was a preferred treatment and in case of any subsequent decision, they are more likely to seek treatment outside the home since it helped to minimize expenditure incurred as a result of the disease (Nyamongo, 2002). A study in Sri Lanka showed that after the establishment of a village treatment centre, the

delay for adults in seeking treatment reduced to 1-2 days but had no change for the children because women preferred taking their children to the government facilities for a more qualified opinion than the local recruited staff (Konradsen et al, 2000). This observation differs from that seen in most African countries. Culture may be playing a role in the differences in the two regions. Studies done in The Gambia showed that 32% of children were presented in coma after 24 hours of onset of malaria. Another study in Ghana also reported that only 10% of caregivers sought treatment the same day of identifying symptoms in their children (Chinbuah et al, 2006). Eighty-five percent of the cases of malaria in children less than five years required the eldest in the household or the father's decision on whether hospital treatment was necessary for the child. Mothers who were primary caregivers made such decisions on 7% of the cases (Okoko and Yamuah, 2006; Hill et al, 2003). Apart from the father, the grandmother, aunt and sometimes a neighbour played a crucial role in determining where to take the child when the situation deteriorated (Makundi et al, 2006). Therefore community norms are important factors that can sway medical decisions. Higher level of education for the caregiver was associated with positive malaria-related practices in Uganda and 63% would take the child to the clinic as the first action and 97% as their first or second option (Njama et al, 2003, Dike et al, 2006). The cultural and social pressure on married women in the Mukono district compelled them to conceal the symptoms until it was certain it was due to pregnancy (Mbonye et al, 2006).

2.2.2 Types of medication used to treat children of malaria

A study in rural Burkina Faso revealed that to treat malaria, roots are transformed into a powder which is added to water or thrown into fire. The child then has to inhale the smoke of the fire or drink the water. They also used ashes or burned the hooves of a donkey to apply remnant into the infant's anus (Beiersmann et al, 2007). According to Warsame et al (2007), traditional treatment was the most frequent sought way to treat the children. Herbs were also the main treatment across five countries in a comparative study of Ghana, Guinea Bissau, Senegal, The Gambia and Sierra Leone (Aikins et al, 1994). Mixtures of all sorts were also used to treat children. In preparing these blends, caregivers mixed elephant dung with marijuana and applied by burning, smearing or bathing them with it. They also fan the convulsed child with herbs, use substances with an offensive odour like garlic and use plant roots to make therapeutic marks on skin. Skin incisions or herbal potions are sometimes used for treating convulsion. Drug treatment practices were often incorrect in that Chloroquine, the first line drug treatment, was correctly administered by 26.3% of mothers, while 50.2% gave correct dose of paracetamol and 4.3% of children received anti-malarial on the day the illness began (Fawole and Onadeka, 2001). A study in the Ho municipality of Ghana showed that 40% of caregivers used artesuante amodiaquine, the first line drug treatment, to treat their children under five years with malaria (Ahiabu, 2007). In another study in The Gambia, the most common course of treatment was the use of tepid sponging and paracetamol to reduce fever before taking the child to the health facility since home treatment was not common (Clarke et al, 2003). In the study by Okrah (2002), malaria was cured with antimalarial drugs like chloroquine, paracetamol and aspirin which they bought from the government health services and merchants. Most respondents regularly used traditional treatments

like flowers of eucalyptus plants, acacia, citronella, guava and leaves and roots of the neem tree. The herbs are boiled and either bathed with or drank. In The Gambia home treatment was uncommon as it was realised that 28% kept paracetamol and only 8% kept Chloroquine. Less than 10% of malaria cases in children were treated with Chloroquine at home and 69% of those giving home treatment did not know the correct dosage for the child (Clarke et al, 2003). Most patients that are treated outside the health facilities are misdiagnosed and given incomplete treatment/inappropriate doses (Espino, 2000). Some pregnant women in Uganda resort to using herbs and clays as a first resort to treating pregnancy ailments including malaria (Mbonye et al, 2006).

CHAPTER THREE

3.0 METHODS

3.1 Type of study

This study is a cross-sectional study. It seeks to obtain information on the knowledge of caregivers on the cause of malaria and their treatment seeking behaviour at a point in time.

3.2 Profile of the study area

Nkwanta district is one of the 12 administrative districts in the Volta Region. It occupies the north-eastern part of Ghana and is located at the northern part of the Volta Region. The maximum distance from north to south is 140 km and east to west 69km. It is the largest of the 12 districts in the Volta region with a total surface area of 5,500 sq. km and covers more than 27% of the regional surface area. Nkwanta is typically rural with no large urban settlements. The Nkwanta district has a total population of about 166,204 inhabitants and a growth rate of 1.9% (Housing and Population Census, 2000). The district consists of five sub-districts namely Brewaniase, Nkwanta, Tutukpene, Kpassa and Damanko. The most populated towns and established market centres in the district are Damanko, Bonakye, Sibi, Brewaniase and Nkwanta. The district is home to some Ewes, Akans, Kabres, Kotokoli, Nanumbas, Konkombas, and Basaris of which the last two are the predominant tribes. Their main occupation is agriculture and trading. Gari processing is common in the villages and the main locally produced crops are yam, groundnut, beans and cocoyam. The district experiences two seasons annually; the wet season from May to September and the dry season from November to February. Table 1 below shows the population distribution among the sub-districts in Nkwanta.

Table 1: Nkwanta sub-district Population at 2006

No	Sub-district	Population	% of Total population
1	Nkwanta	38,227	23.0
2	Tutukpene	16,620	10.0
3	Brewaniase	24,931	15.0
4	Kpassa	53,189	32.0
5	Damanko	33,241	20.0
Total		166,204	100.0

Source: Nkwanta Annual Report, 2006.

There are twenty-one health facilities in the district of which 74% are run by the government and the rest private or mission. There are two hospitals, 15 operational CHPS zones and some maternity homes and clinics. The main health issues in the district are communicable diseases with malaria topping the list (Nkwanta Annual Report, 2006). It forms about 26% of all hospital admissions, 41% of outpatient (OPD) attendance, of which 36.6% occurred in children under five years in the year 2005 (Nkwanta Annual Report, 2006).

3.3 Variables

Knowledge and perception of malaria

Variable name: Causes of malaria

Definition: The caregiver's knowledge about cause of malaria.

Variable measurements or options (multiple responses):

- Dirty environment
- Playing in the sun for too long/ heat of the sun
- Mosquito bite
- Eating cold/contaminated food
- Natural/An act of God.
- Others…..

Variable name: Basis of diagnosis

Definition: Signs and symptoms of malaria.

Variable measurement (multiple responses):

- Fever /hot body
- Vomiting
- Diarrhoea
- Loss of appetite
- Shivering
- Convulsions
- Yellowish urine/eyes
- Others….

Variable name: Perception of malaria

Definition: Local/community understanding of malaria

Variable measurements (multiple responses):

- Killer disease

- Children's disease
- Everybody's disease
- Seasonal disease
- Others….

Criteria for having knowledge of malaria:

Respondent answers as the cause of malaria, mosquito bite.

Respondent answers as symptoms of malaria, any three of the first seven options on the questionnaire.

Treatment options for treating children of malaria

Variable name: Treatment seeking behaviour

Variable definition: Any place that caregivers go to seek treatment for their children when they have malaria.

Variable measurement:

- Hospital/clinic
- Herbalist
- Pharmacy/Chemical shop
- Faith healers/spiritualist
- Home treatment/management
- What is/are the reason(s) for your choice(s)?

Variable name: Duration to seek treatment.

Definition: How long it took the caregiver to start treatment after onset of malaria symptoms.

Variable measurement:

- same day
- 2 days
- 3days
- 1 week
- Others....

Variable name: Drugs used treating malaria

Variable definition: Type of drug given to the children under five years with malaria

Variable measurements (multiple responses):

- Chloroquine
- Artesunate
- Artesunate amodiaquine
- Amodiaqunine
- Sulfadoxine pyrimethamine
- Quinine
- Paracetamol
- Herbs (what types were used)
- Concoctions
- Others….

Variable name: Place of purchase of drugs

Variable definition: where the caregiver gets drugs/medicine to treat children with malaria

Variable measurements:

- Hospital/clinic
- Herbalist
- Chemical shop/vendor/Pharmacy
- At home/left over from previous episode

Factors contributing to treatment seeking behaviour

Variable definition: Factors affecting treatment-seeking behaviour of caregivers

Variable measurement:

- Health provider factors (health system structure, availability of staff, user fees, accessibility, attitude of health workers)
- Economic status (income level, type of occupation, level of education)
- Socio-cultural factors (family structure (type of marriage and number of children in family, decision making), attitude, knowledge of caregiver on malaria).

Treatment Practices

Variable name: Treatment Practices of caregivers

Variable measurements:

- Bathing the child with cold water/sponging
- Using herbs/concoctions (leaves and roots of neem)
- Inhale smoke from burning roots and herbs/or drink the solution
- Drugs-paracetamol, aspirin, chloroquine (problems with dosage and administration)
- Others….

Demographic characteristics (Potential confounders)

Age

Sex

Marital status

Educational level

Occupation

Religion

Household size

Cooking fuel

Ethnic group

3.4 Study population:

The study population consists of all caregivers in the selected sub-districts of Nkwanta, Tutukpene and Brewaniase who have treated malaria for their children less than five years in the past six months.

3.5 Sample size:

Using the Epi info software with a 95% confidence interval, a target population of 166, 204 and the maximum acceptable margin of error of 5%, the minimum sample size obtained was 399. However it was rounded off to 400 respondents to make up for non response.

3.6 Sampling method

A multi-stage cluster sampling method was used to recruit caregivers with children under five years. Using the geographical location of the five sub-districts, three of them were selected purposively. Each community was considered a cluster and with the total sample size of 400 caregivers, 40 communities were selected using simple random selection technique. From each community or cluster, 10 households were visited to obtain the 10 caregivers. To obtain the first household, an estimated centre of the community was determined with the help of a community leader. A pen was spun and all the houses in the direction of the tip of the pen were numbered to the boundary of the community. The numbers were written on paper and tossed. The number picked became the starting point for that community. Subsequent households were selected systematically to make up ten in total. If a household contained more than one caregiver with a child less than five years, one of them was selected at random.

For respondents for the FGDs, three communities were selected at random. From each community, 12 caregivers with children under five years were randomly selected and interviewed.

3.7 Data collection Techniques/Methods and Tools

A combination of both quantitative and qualitative approaches was used to collect data on treatment seeking behaviour of caregivers in children under five. A structured questionnaire was designed and responses were elicited one-on-one from selected respondents. The questionnaire was divided into three parts to obtain responses on demographic characteristics, knowledge and perceptions of caregivers on malaria (causes, signs and symptoms), perceptions, treatment seeking behaviour and practices (who the mother consults when the child has malaria and factors influencing behaviour).

Qualitative data was obtained through interviews using FGD guide, note book and a tape recorder during the FGDs. This was to allow for further explanations and insight into the treatment behaviour of caregivers in the district.

A focus group is a group discussion which allows people from similar backgrounds or experiences to discuss focused topics of interest for a researcher. Focus groups give the opportunity to explore people's beliefs, attitudes and opinions. It cannot be used for the discussion of sensitive issues like abortion and sexual behaviour. It produces a lot of information far more quickly and at less cost than individual interviews and excellent for obtaining information from illiterate communities as Nkwanta is known for high illiteracy. The data can be easily managed by people not trained in qualitative research

methods when relatively simple issues are explored. Due to the flexibility of questioning, attitudes and opinions that might not be revealed in a survey questionnaire are revealed. On the other hand, results from focus groups cannot usually be used to make statements about the wider community. The moderator can easily influence the participants into answering questions in a certain way if not well trained. It also has limited value in exploring complex beliefs of individuals, and as a result, in-depth interviews would be more appropriate. Focus groups can paint a picture of what is socially acceptable in a community rather than what is really occurring or believed but can be limited by careful participant selection and good moderating skills.

3.8 Pre-testing of survey tools

Research assistants were trained to collect data from caregivers in two selected communities outside the selected study communities. The questionnaire was pre-tested on 15 non-participating caregivers and necessary modifications made afterwards at the District Health Directorate Resource Centre.

3.9 Quality Control

Questionnaires were reviewed for completeness and consistencies daily and any missing data was completed by revisiting respondents. Data was cleaned before and after entry to further reduce errors. Data was double entered and the two entries compared to increase reliability and validity of the results obtained. All questionnaires were administered in Twi since it is the medium of communication for the people of Nkwanta. Randomly

selected questionnaires were re-administered to the same respondents after data was collected to ensure consistency and completeness of the data.

3.10 Data Processing and analysis

Data entry for the quantitative data was done using Epi Info version 3.3.2 and analysis was done using both SPSS software version 11.5 and Epi Info version 3.3.2. Simple frequencies and proportions were used to compare variables. Inferential statistics-chi squares and p-values were also employed to examine independent contributions of variables of interest to treatment seeking behaviour. The effects of some factors as age, sex, marital status, ethnic group, occupation, religion, and socio-economic status on treatment behaviour were also examined. Qualitative data was analysed manually after transcription.

3.11 Ethical consideration

Ethical clearance was obtained from the Ghana Health Service Ethical Review Committee. Permission to conduct the study was sought from the Nkwanta DDHS and District Assembly. Informed consent (written and verbal) was obtained from respondents to participate fully in the study. Contents of the consent form covered issues of privacy and confidentiality of the data, voluntary participation and options for opting out.

3.12 Limitations of the study

This study was conducted during the major rainy season of the district (May to September) and as a result accessibility of some of the sub-districts and communities was

difficult. Therefore the sub-districts used for this study were purposively chosen considering their geographical locations in the district. The study period of only three months is rather too short and does not allow for a larger sample size for both the quantitative and qualitative data to cover the entire district.

CHAPTER FOUR

4.0 RESULTS

4.1 Demographic characteristics

Of the four hundred (400) respondents, 97.5% of them were females. Majority (nearly 56%) were aged between 25-34 years, 22.5% were between the ages of 15-24, and the rest were more than 34 years. Thirty-six percent of the respondents had no formal education while 64.0% had some formal education of which one person had tertiary education. Almost 63.0% were Christians, 11.5% were Moslems, and 25.8% were traditionalist/spiritualists. The main ethnic groups in the three sub-districts were the Guans forming 38.5%, Konkombas (27.5%) and Ewes were 13.5%. Table 2 below shows the detailed demographic characteristic in detail

Table 2: Demographic Characteristics of all respondents in Nkwanta district, 2008*.

Characteristics	Number of respondents	Percent (%)
Sex Female	390	97.5
Male	10	2.5
Age 15-24	90	22.5
25-34	222	55.5
35-44	86	21.5
45-54	2	0.5
Level of Education		
None	144	36.0
Primary	83	20.8
JSS	145	36.3
SSS+	28	7.0
Marital status		
Single	16	4.0
Married	363	90.8
Divorced/separated	13	3.3
Widow/widower	4	1.0
Cohabitation	4	1.0
Religion		

Christian	251	62.9
Moslem	46	11.5
Traditional	103	25.8
Ethnic group		
Akan	8	2.0
Ewe	54	13.5
Guans	154	38.5
Konkomba	110	27.5
Kotokoli	36	9.0
Basari	26	6.5
Others	12	3.0

*Total number of respondents=400

Caregivers who were employed were 94.3% (bakers, farmers, hairdressers, dressmakers, etc) and 5.8% were unemployed. Majority (90.1%) take care of households of size less than 10 persons. Seventy-six percent use firewood at home. Table 3 shows the socio-economic status of respondents.

Table 3: Socio-economic status of respondents in Nkwanta district, 2008*.

Characteristics	**Number of respondents**	**Percent (%)**
Occupation:		
Self employed	370	92.5
Civil & public service	7	1.8
Unemployed	23	5.8
Cooking fuel:		
Gas	6	1.5
Charcoal	90	22.5
Firewood	304	76.0
Household size:		
<5	191	47.8
5-9	169	42.3
10-14	35	8.8
>14	5	1.3

*Total number of respondents=400

4.2 The knowledge on causes and symptoms of malaria.

Of the 400 respondents, 396 (97.5%) of them had heard of malaria. The main sources of information mentioned by caregivers were health workers (90.9%), media (radio, TV, posters and newspapers) 33.5%, friends (16.9%) and family members (4.3%). Of the 396 caregivers, 78.3% correctly identified mosquito bite as the cause of malaria. Other common responses include dirty environment, eating contaminated foods, cold weather, and playing in or heat from the sun as shown in table 4.

Table 4: Causes of malaria identified by respondents of children under five years in Nkwanta district, 2008*. (Multiple responses)**

Causes of malaria	Number of respondents	Percent (%)
Dirty environment	214	54.0
Eating cold/contaminated food	87	22.0
Mosquito bite	310	78.3
Cold weather	16	4.0
Playing in/heat from the sun	99	25.0
Natural/from God	2	0.5

*Total number of respondents=396
** Multiple responses = respondent can select more than one of the options provided on the questionnaire.

Most caregivers could identify signs and symptoms in their children but 8.0% could not identify any sign or symptom. Of the 364 who could, fever/hot body, vomiting, diarrhoea

and yellowish eye/urine were the symptoms mainly mentioned. Table 5 lists the signs and symptoms of malaria cited by respondents.

Table 5: Signs and Symptoms of malaria identified by respondents of children under five years in Nkwanta district, 2008*. (Multiple response)

Signs and Symptoms of malaria	**Number of respondents**	**Percent (%)**
Hot body/fever	336	92.3
Vomiting	150	41.2
Loss of appetite	122	33.5
Diarrhoea	91	25.0
Convulsions	43	11.8
Yellowish urine/eye	261	71.1
Shivering	5	1.4

*Total number of respondents=364

Respondents reported similar causes of malaria during the FGD. Some of their views are stated below.

> *"When the children do not wear clothes and they walk under the cold weather, they fall sick of malaria."*
>
> *"We do work in the hot sun together with the children and so the heat of the sun makes them fall sick."*
>
> *"The foods we give our children are not good. We allow flies to settle on them before the children eat it which is not hygienic."*
>
> *"It is due to our evil doings that is why malaria attacks us."*
>
> *"We ourselves are dirty our kitchens and houses are dirty so mosquitoes are always around us and it gives us fever. When we open tin cans like tin tomatoes*

and milk, we should try as much as possible to dispose off the empty cans, it should not be left around so that it accumulates water for mosquitoes to breed in them."

Of the 400 caregivers interviewed, 46.8% of them had knowledge of malaria and 53.3% had no knowledge based on the criteria mentioned in chapter 3. Of those who had knowledge, 26.2% had no formal education and 26.2% had primary and JSS education whiles 44.6% of those who had no knowledge had no formal education. Table 6 shows the knowledge score of caregivers on malaria.

Table 6: A summary of the knowledge score of caregivers on malaria in Nkwanta, 2008.

Knowledge Category	**Frequency**	**Percent (%)**
Has knowledge	187	46.8
Has no knowledge	213	53.3

Associations between knowledge score and some socio-demographic characteristics of caregivers were tested using chi-square test statistic. Table 7 shows statistically significant associations between caregivers' knowledge of malaria and their level of formal education, ethnicity, household size, place of residence and their socio-economic status (p = 0.0001, 0.0004, 0.0107, 0.004 and 0.0175 respectively).

Table 7: Analysis of association between level of knowledge and socio-demographic characteristics of respondents in Nkwanta, 2008.

Variable	**Knowledge**	**p-value**

	High	Low	
Age of caregivers			
<35	139	173	0.097
35 and more	48	40	
Level of education			
None	49	95	0.0001*
Formal	138	118	
Ethnic group			
Guans	86	68	0.0004*
Others	101	145	
Household size			
<5	102	89	0.0107*
5 and more	85	124	
Place of residence			
Brewaniase	49	31	0.004*
Others	138	183	
Socio economic status			
Low	132	172	0.0175*
High	55	41	

*significant associations p<0.05

4.3 Treatment options of caregivers.

Majority (71.4%) of caregivers whose children under five years had had malaria sought treatment mainly at the hospital or the health centre as their first point of call. Almost 27% bought drugs from the pharmacy/chemical shop and 0.7% sought relief from the herbalist as shown in table 8. Of the 113 caregivers whose children had not suffered from malaria in the last six months, 78.8% reported they would have sought treatment at the hospital and 20.4% at the pharmacy shop. Results of the qualitative data also revealed that the hospital and the chemical shops/pharmacy were the main places caregivers treated their children under five years of malaria in the district.

Table 8: Treatment sources reported by respondents in the Nkwanta district, 2008.

Source of Treatment	Number of respondents
Pharmacy	79 (26.9)
Herbalist	2 (0.7)
Hospital	202 (71.4)

*percentages are in parenthesis

Most (72%) of caregivers opted for these treatment options because they claim it's a faster method of treatment and about a fifth (20%) said it was cheaper. Other reasons were nearer (15.7%) and a popular choice (14.4%).

4.4 Factors affecting the choice of treatment of caregivers.

There was statistical significance between seeking treatment at the pharmacy and household size of less than five (p=0.02). Table 9 shows other tested associations with the two main treatment options.

Table 9: Testing of association between treatment options and socio-demographic characteristics in Nkwanta, 2008.

Variables	Health centre/hospital		p-value	Pharmacy		p-value
	+	-		+	-	
Religion			0.82			0.87
Christian	130	51		48	133	

Non Christian	72	30	28	74	
Educational level			0.30		0.10
None	78	26	22	82	
Formal	124	55	54	125	
Household size			0.17		0.02*
<5	42	83	42	83	
5+	34	124	34	124	
Marital status			0.69		0.54
Married	185	73	68	190	
Not married	17	8	8	17	
Socio-economic Status			0.42		0.88
High	153	65	59	159	
Low	49	16	17	48	
Decision making			0.31		0.15
Father	103	36	32	107	
Others	99	45	44	100	
Knowledge of caregiver			0.51		0.11
Has knowledge	96	42	43	95	
No knowledge	106	39	33	112	
Age of caregiver			0.30		0.83
<35	161	60	60	161	
35 or more	41	21	16	46	

* significant association p<0.05
+ number of caregivers who chose hospital or pharmacy with corresponding variable characteristics.
- number of caregivers who did not chose hospital or pharmacy with corresponding variable characteristics.

Only 56 of 283 respondents (19.8%) sought treatment within 24hours of the onset of malaria for their children. There was an association between delay at home and seeking treatment at the pharmacy and hospital/health centre. Table 10 shows statistically

significance associations between seeking treatment at the chemical shop and hospital with other factors of delay ($p<0.05$).

Table 10: Testing of association between treatment options and some factors of delay.

Variable	Health centre/hospital		p-value	Pharmacy		p-value
	+	-		+	-	
Delay at home			0.001*			0.003*
2 or less days	61	41		38	64	
2+ days	141	40		38	143	
Time spent at source			0.00*			0.00*
<10mins	24	55		53	26	
10mins or more	178	26		23	181	
Time taken to source			0.00*			0.00*
<30mins	100	73		67	106	
30mins or more	102	8		9	101	

*significance associations $p<0.05$

4.5 Treatment seeking behaviour and practices of respondents

Almost all children (approximately 90%) who were treated at the hospital and pharmacy were given paracetamol, about 55.0% were given the recommended drug, artesunate amodiaquine. Eleven percent took sulphadoxine pyrimethamine (SP) while 18.0% were administered chloroquine. Table 11 shows this and other medications given to children under five years.

Table 11: Medication given to children under five who sought treatment at the hospital/pharmacy (multiple responses).

Medication	Frequency	Percent (%)
Paracetamol	254	89.8
Chloroquine	51	18.0
Artesunate	18	6.4
Artesunate amodiaquine	155	54.8
Amodiaquine	26	9.2
SP	31	11.0
Herbs	9	3.2
Others	79	27.9

In addition, other medications given were antibiotics, ORS, blood tonics and vitamins. Of the 51 who gave their children chloroquine, 34 (67.0%) got them from the chemical shop/pharmacy and 17 (33.0%) from the health centre. Almost 12% of respondents reported that they treated their children for malaria with concoctions/herbal preparations which were either obtained from the herbalist or at home. Qualitative data revealed that respondents use preparations made from spices like ginger, "pepre" and pepper, cassava leaves, tea leaves/grasses, black powder, neem tree, pawpaw leaves, lime and herbs and these preparations were sometimes given through the anus using bulb syringe.

> *"We use spices like 'pepre', ginger and pepper to enema them by putting into their anus and these are normally used to treat them and are effective to them."*
>
> "*We boil the herbs and bath the children with it" or "we boil the local herbs for them to drink then they urinate the fever"*
>
> *"Fever medicines are not smeared on the body like pomade."*
>
> *"We heat their anus with hot water for sometime or we put ginger in their anus"*

"If the child becomes warm, we bath the child with cold water and give him/her some paracetamol syrup if available to reduce their body temperature."

Of the 28 respondents who used concoctions to treat malaria in their children, 67.9% had no knowledge of the cause and symptoms of malaria, 42.9% had no formal education and 25% had a household size of less than five people.

Of the 283 respondents, only about a fifth (20%) sought treatment within 24 hours of the onset of malaria symptoms while 80.2% sought treatment for their children after more than 2 days as shown in table 12 below. Of 283 respondents, 61.1% of caregivers got to the treatment centres in less than 30 minutes and 75.6% spent not more than an hour at the health centre or pharmacy. About ninety-two percent (92.2%) reported that their children were recovered from malaria after seeking treatment. However, 1.1% had their children dying and 6.7% of caregivers' children were still ill.

Table 12: Time taken by caregivers to seek treatment for child with malaria.

Time	*Frequency*	*Percent (%)*
Same day	56	19.8
2 days	46	16.3
3 days	70	24.7
4 days	59	20.8
5 days	46	16.3
More than 5 days	6	2.1

Forty-nine percent of the 283 caregivers who treated their children of malaria said fathers normally took the decision concerning the place of treatment when the child was ill. Almost forty-seven percent (46.6%) took the decision in conjunction with the father of the child. In-laws and other relations formed 4.2% of responses obtained as those who influence treatment seeking behaviour. Results from the qualitative data also show similar responses as fathers', mothers' or both or in-laws influence the treatment option of caregivers for their children under five years. Some responses were

> *"It is not at every home that the woman can take decisions, at some homes it is the man who authorises the woman to take the child to an appropriate place for health care."*
>
> *"Some in-laws take decisions because they are the major stake holders in the house."*
>
> *"Decision making for health care is by both the husband and wife."*
>
> *"Men take most of the decisions because they are the head of the family and the house."*
>
> *"If the woman does not have money and the man has yet does not ask the woman to send the child to the hospital/clinic, the woman would ask the man to give her money."*

CHAPTER FIVE

5.0 DISCUSSION

Eradication of malaria is a preferred option for all endemic countries. However, even though medical and social science interventions have been employed to achieve this purpose, yet this menace still persists and takes the lives of millions of people annually including children under five years. The WHO's Home based care strategy was adopted in Ghana to empower caregivers in malaria recognition and early treatment. Even though the level of knowledge on causes of malaria was low, most caregivers (91%) were able to identify signs and symptoms of malaria. This finding was similar to other findings (Malik et al, 2006; Oreagba et al, 2004; Oguonu et al, 2005). Other studies in Ghana however reported high knowledge of malaria among caregivers (De La Cruz et al, 2006; Njama et al, 2003). A mixed knowledge of the aetiology of malaria consisting of both biomedical and local or cultural beliefs was also identified in this study and this supports other findings (Miguel et al, 1998; Sanjana et al, 2006; Espino et al, 1997; Okrah et al, 2002; Makundi et al, 2006; Warsame et al, 2007).

Paradoxically, not all mothers who could mention appropriately what causes malaria could equally identify symptoms in their children. Even though they form a small proportion of caregivers in this study, it is very significant if early treatment of malaria in children under five years should be improved to reduce child and infant morbidity and mortality. The gap realized in this study between knowledge of the cause of malaria and the ability of caregivers to identify the symptoms in the children would have to be

bridged to improve upon early treatment. This can be achieved by strengthening home-based care in the district as well as continuous educational programs to inform caregivers of causes and symptoms of malaria. Caregivers' educational level, ethnicity and household size have shown significant associations with the knowledge of caregivers on malaria in this study ($p<0.05$). Caregivers who have no formal education are less likely to have a higher level of knowledge about malaria than caregivers with some formal education. Caregivers from Brewaniase were more educated than others which showed that the place of residence of caregivers was associated with having a higher level of knowledge about malaria. It follows logically therefore that guans are also more likely to have a higher level of knowledge about malaria than non-guans as found in this study. A study in Sudan (Malik et al, 2006) reported that level of formal education was not associated with the level of knowledge of caregivers contradicting the results of this study. Even though the age of caregivers was not associated with knowledge about malaria in this study, another study in Nigeria (Fawole and Onadeka, 2001) reported that age and formal education were significantly high even though their knowledge on malaria was poor. In addition to having spiritual connotations to the cause of malaria, many caregivers perceive it as seasonal and a killer disease in this study. This conforms to earlier studies (Aikins et al, 1993; Nuwaha, 2002; Savigny et al, 2006; Comoro, 2003; Ahorlu, 1997). Caregivers who stated that malaria was seasonal and a killer are more likely to have a higher knowledge of malaria than those who stated otherwise. It however did not seem to affect treatment choice of caregivers.

In Ghana and other parts of Africa, caregivers seek treatment from a variety of sources and reliance on a single source is rare. The caregivers' choice of hospital and pharmacy

as the first point of call for treating their sick children is supported by a study in Tanzania (Savigny et al, 2004) but contradicts the findings of other studies in Ghana and Sudan respectively (Ahorlu et al, 1997; Malik et al, 2006) where conventional treatment was the last resort after self treatment at home for reasons of high cost of treatment. In this study, caregivers first two options for seeking care their children was at the hospitals and the pharmacy. Their level of knowledge on causes of malaria did not seem to translate into early treatment seeking for their children at the hospital and pharmacy. Poverty and accessibility to health facilities have been shown to influence modern methods of treatment (Nyamongo, 2002; Malik et al, 2006; Muller et al, 2003). In the study area, the district has rolled out a lot of programs such as GEMI and ENHANCE to reduce child morbidity and mortality in the district. These programmes provide free services and medicines to caregivers with children under five years in the district. Also, Nkwanta district is a model district in Ghana with 13 CHPS zones which brings health service to the door-step of the people and has helped reduced the problem of accessibility to health care as well as the cost of treatment. The availability of these programs in the district may have influenced the reasons given by caregivers as concerning treatment at the hospital and pharmacy as being faster, nearer and cheaper methods. Nearly ninety-three percent of caregivers got to the source of treatment within an hour with the majority getting to the source of treatment in less than thirty minutes. These factors may have contributed immensely and positively to treatment seeking behaviour of caregivers in this district. Seeking health through the conventional system is likely to improve in other rural settings similar to that of the Nkwanta district if such strategies are adopted.

Delay at home, the time taken to reach facilities, and time spent at the facility, were strongly associated with treatment behaviour. Caregivers who sought treatment in less than two hours are more likely to have sought treatment from the pharmacy/chemical shop than the hospital because of the relatively shorter time spent there. Caregivers are also more likely to take a shorter time, which is less than 30mins, to get to the pharmacy than the hospital. Household size was strongly associated with seeking treatment at the pharmacy and this is similar to another finding from Tanzania (Savigny, 2004). This implies that caregivers of smaller household sizes are more likely to visit the pharmacy than those of a larger household size. Despite the fact that most of the caregivers in this study visited the hospital or the pharmacy/chemical shop for treatment, a significant majority about a third (26.1%) of them gave their sick children some medication at home. Most of the medications they gave their children were obtained from the pharmacy or chemical shop. An equally high number of them obtained medication from home. Home treatment may involve the use of herbs and other preparations known to the mother or obtained from the herbalist who were also visited by caregivers (10%) for medication or leftovers of any kind therefore sub-dosages may abound. Appropriate medications as well as the treatment regimen from the chemical shops may be compromised if chemical shop owners are not well educated on how to dispense drug for the children especially with AS/AQ which involves the use of children's weight. Herbal mixtures for treating malaria in children may have detrimental effects due to the toxicity of some of the herbs used. However caregivers rely on dosage on grounds of experience from its regular use. In this regard, there is the need to incorporate chemical sellers in the wide spread educational

campaigns in the district on appropriate treatment since they are the first line of call for malaria treatment.

Almost fifty five percent of the children under five years were treated with the combination therapy artesunate amodiaquine, the recommended first line drug for the treatment of simple malaria in Ghana. Despite this, monotherapy was also common as most caregivers used artesunate alone. It is interesting that about a fifth (18%) of caregivers still use chloroquine which was mostly acquired from the pharmacy/chemical shops. A study conducted in the Ho municipality of Ghana reported a level of acceptance for ACT to be almost 40% in 2007 (Ahiabu, 2007). It appears therefore that the level of acceptance as found in this study, three years of its implementation in Ghana, has increased. More and more people are thus using the combination therapy which is encouraging. In spite of the improvement in the use of ACTs, the continuous use of Chloroquine to treat malaria may be detrimental to the success of the new policy. It is therefore crucial to put strategies in place to ensure that chloroquine is no longer available in health centres and chemical shops/pharmacies in Ghana.

In spite of the availability of conventional forms of treatment, approximately twelve percent of caregivers used all forms of concoctions to treat their children. The concoctions comprise of a combination of herbs, cassava leaves, black powder, tea leaves or grasses, neem tree, and spices like ginger, pepper and “pepre”-a local spice.” Most of them form initial remedies and reporting to the hospitals is only done when they fail to achieve the purpose for which they were meant. If Ghana intends to reduce morbidity and

mortality in children under five years and achieve the Abuja target i.e. reducing mortality in children by 40% and 60% of those with malaria should have access to prompt and appropriate treatment within 24 hours of illness onset by 2005, and effectively control of malaria in the country, this practice must be critically considered. One of the cardinal pillars for the management of malaria in children under five years is prompt and effective treatment. However only 19.8% of the caregivers interviewed treated their children within 24 hours of the onset of malaria symptoms at the hospital and 80% sought treatment after two days or more. A study in southern Ghana reported that 11% and 33% of children received appropriate treatment within 24 and 48 hours respectively (Ahorlu et al, 2006) and about 10% in another study in Ghana (Chinbuah et al, 2006). Caregivers should be encouraged to seek treatment early by strengthening home based care in the districts.

Delay in seeking treatment may be related to decision making in the household. In this study, fathers form the majority of those who decide where children receive health care because they normally pay for the treatment. This finding is similar to others (Okoko and Yamuah, 2006; Makundi et al, 2006). Other studies however contradicts this finding and report that caregivers themselves take the decision (Malik et al, 2006; Hill et al, 2003) or both caregivers and fathers may collectively take the decision concerning place of treatment for their children. Fathers should be incorporated in educational programmes since they directly affect early treatment seeking and consist of a percentage of caregivers in this and other studies.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Most caregivers had knowledge about the cause and symptoms of malaria. The mosquito bite was the main cause named by caregivers. A mixed knowledge of the aetiology of the disease was identified as they mentioned poor personal and environmental hygiene, contaminated food and playing in /heat from the sun among others as other causes of malaria. Most caregivers mentioned fever/hot body, vomiting, loss of appetite, diarrhoea, yellowish urine/eyes as the main symptoms identified. Even though caregivers were able to identify symptoms of malaria in their children, only a fifth of them sought treatment at the hospital within 24 hours of symptoms onset. Their level of knowledge on the causes of malaria was however influenced by their level of formal education. Home based care management strategy in a district can help to improve early identification of symptoms as well as early treatment seeking. Majority of caregivers in this district sought treatment at the hospital/health centre or chemical shops. Multiple methods of treatment were used by caregivers in the district. Although most caregivers relied on modern methods of treatment of malaria for their children under five years i.e. the hospital and the pharmacy/chemical shop, herbal preparations obtained from herbalists and at home were also being administered to children under five years. Treatment seeking behaviour was found to be influenced by delays at home and at the health centre. More than half of caregivers used the recommended first line drug, artesunate amodiaquine, to treat uncomplicated malaria in their children. The level of acceptance of this new drug is commendable three years after its implementation in the country. However, the continuous use of chloroquine and artesunate monotherapy can be detrimental to the

success of the new drug policy. The use of herbs to treat children under five years may be harmful since the risks are not readily known. Delay at home and at the health centre/hospital affect the treatment behaviour of caregivers in this district.

6.2 Recommendations

Nkwanta DHMT

1. The Nkwanta DHMT should consider strengthening the concept of home based care. The health staff should continuously educate caregivers on:

- the early identification of signs and symptoms of malaria in children under five years
- seeking early treatment i.e. within 24 hours of the onset of signs and symptoms in their children.
- the risks (toxic nature of some herbs might cause problems) involved in the use of concoctions to treat malaria in their children under five years to reduce mortalities and improve child health in the district.
- education of caregivers, health staff and chemical shop owners on the use of the ACT to treat malaria in children under five years.

The National Malaria Control Program

- The National Malaria Control Program in collaboration with the MOH/GHS should put strategies in place to ensure that Chloroquine is

removed from all health centers and chemical stores/pharmacy within the country.

- The NMCP should scale up the implementation of WHO's home-based care strategy to cover the whole district.

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APPENDIX:

Sample of Consent Form for Participants

Request for Consent to Participate in a Research Study

Study Title: Malaria Treatment-Seeking Behaviour among Caregivers of Children Under Five Years in the Nkwanta District.

Introduction: I am a student from the School of Public Health, University of Ghana conducting a research study in the Nkwanta District to determine the malaria treatment-seeking behaviour among caregivers of children under five years. This study is concerned with caregivers' knowledge on malaria-what caregiver's of children know about the cause and symptoms of malaria. It also looks at where caregivers' prefer to take their children for treatment of malaria and some factors that may prevent them from getting health care at their preferred treatment option. This study will help provide information on how best to improve health care delivery and reduce morbidity and mortality in children under five years in the district.

Kindly read or have this consent form read to you before deciding whether to participate in the study. Kindly sign or thumbprint below if you agree to take part in the study. A copy of this consent form shall be provided to you.

Study Procedure: You are being invited to answer a few questions relating to knowledge and perceptions of caregivers on malaria, treatment options and factors influencing treatment seeking behaviour and caregivers' practices on treating their

children of malaria. Your participation in this study will last for 20-25 minutes and will end in a day.

Benefits: You will not have direct benefit from the study for your participation; however, the information obtained will help reduce malaria mortality in children under five years.

Risks/Discomforts: The risks involved in taking part in the study include the inconvenience that the interview will cause you and the time you will spend answering questions.

Confidentiality: All information that will be provided will be treated as confidential and reference would not be made to any participant by name.

Volunteering: Participation in this study is wholly voluntary and refusal to participant will not attract any sanction or punishment. Respondents are at liberty to answer or refuse to answer any question put to them.

Contacts: if you have any questions regarding the rights as a participant in this study, you may contact the District Health Directorate or me, Pamela Eyram Ofori- Kuma, the principal investigator on telephone number 0244873288 or email pamieyram@yahoo.com.

Signature/Thumbprint…… Witness's Signature……

Date…… Date……..

QUESTIONNAIRE FOR CAREGIVERS

MALARIA TREATMENT SEEKING BEHAVIOUR AMONG CAREGIVERS IN CHILDREN UNDER FIVE YEARS IN THE NKWANTA DISTRICT.

Questionnaire ID…….. Date of interview…….....

Community…… Cluster number.....

Name of Interviewer……..... Name of respondent……

Date of birth of child..... Child's sex.....

DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS			
NO	QUESTIONS	CODE	VARIABLES
Q1	**Sex** Male……1 Female……2	☐	Q1Sex
Q2	**Age** 15-24……1 25-34……2 35-44……3 45-54……4 55-64……....5 65+……....6	☐	Q2Age
Q3	**Religion** Catholic……1 Anglican……2 Presbyterian……..3 Methodist……4 Charismatic.....……5 Moslem……6 Traditional/spiritualist……..7 No Religion……..8 Other, specify ……....99	☐	Q3Relgn
Q4	**Educational level** None……..1 Primary……..2	☐	Q4Edu

	Secondary (JHS/SHS)…….3 Tertiary (university/polytechnic)……4		
Q5	**Occupation** Farmer……1 Trader ……2 Civil servants……..3 Dressmaker/Tailor……...4 Public service.....5 NGO…….....6 Unemployed/no job.....7 Other, specify ……99		Q5Ocptn
Q6	**Marital status** Single……1 Married……..2 Divorced…….3 Separated……4 Widow/widower…….5 Cohabitation……6 Other, specify……...99		Q6MStat
Q7	**Ethnic group** Akan……1 Ewe……..2 Adele……....3 Achode……4 Ntrubo……...5 Challa……6 Konkomba……7 Basari……8 Other Guans…....9 Other, specify.....99		Q8Ethnic
Q8	**Household size** <5……...1 5-9……2 10-14……3 14+……4		Q9Hldsz
Q9	**Cooking fuel** Electricity……1 Gas……....2 Kerosene……3 Charcoal……..4 Firewood……5		Q7CF

	Other, specify…….99		
SECTION A: KNOWLEDGE AND PERCEPTION OF MALARIA.			
Q10	**Have you ever heard of malaria?** Yes……1 No……2	☐	Q10HEARD
If NO, end the interview. **If yes, continue to Q11**			
Q11	**From whom/where did you hear about malaria?**(*choose all that apply*) Radio……1 TV……2 Newspaper/magazine……3 Poster……4 Health worker……...5 Family member……....6 Friends……7 Other, specify……..99	☐	Q11FMWHER
Q12	**What is the cause of malaria?** (*choose all that apply*) Dirty environment……1 Eating cold food……2 Mosquito bite……3 Cold weather……..4 Playing in the sun/heat from the sun……5 Natural/from God……6 Don't know……..7 Other (specify)……99	☐	Q12CAUSE
Q13	**Do you know when your child has malaria?** Yes……1 No……2	☐	Q13CHMAL
If NO, skip to question 15 **If yes, continue to Question 14**			
Q14	**What signs do you see that tells you that your child has malaria?** **(*choose all that apply*)** Fever/hot body……...1 Vomiting……2 Diarrhoea……3	☐	Q14HUK

	Loss of appetite……..4 Shivering…….5 Convulsion……..6 Yellowish urine/eye……7 Sweating…….8 Inactive……...9 Other, specify……..99		
Q15	**Which group of people in your community usually contract malaria?** ***(choose all that apply)*** Children……1 Adults……...2 Everyone……..3 Pregnant women.....4 Other (specify)……99		Q15GPGM
Q16	**How do you see or perceive malaria?*(choose all that apply)*** **Read options!!** Seasonal disease……1 Killer disease……..2 Natural from God……..3 Punishment……4 Witchcraft/evil spirit.....5 Other, specify……99		Q16SEE
SECTION B:TREATMENT SEEKING BEHAVIOUR AND PRACTICES OF CAREGIVERS			
Q17	**How many of your children are under the age of five?** One……..1 Two……...2 Three…….3 Four or more…….4		Q17CHNUF
Q18	**Has any of your children under five years had malaria in the past six months?** Yes……1 No……..2		Q18LAST

If NO, continue to Q19 &Q21 only, then end interview. **If yes, continue to Q20**			
Q19	**If your child should have malaria, where would you take him/her?** Pharmacist……..1 Herbalist……2 Hospital/Health centre……3 Faith healer……4 At home……5 Soothsayer……6 Other, specify……99		
Q20	**Where did you take your child for treatment when he/she had malaria? (*Choose all that apply).*** Pharmacist……..1 Herbalist……2 Hospital/Health centre……3 Faith healer……4 At home……5 Soothsayer……6 Other, specify……99		Q19PORx
Q21	**For your choice in Q20, what was your reason for choosing that treatment source? *(choose all that apply)*** Cheaper……1 Fast treatment……2 Family's choice……3 Popular choice……4 Neighbour……5 Nearer……6 Other, specify……99		Q20REASN
Q22	**Apart from your choice in Q20, did you take your child for treatment elsewhere?** Yes……1 No ……2		Q21OTRT
If NO, skip to question 24 **If yes, continue to Q23**			
Q23	**Where did you take your child after the first treatment?** Pharmacist……1 Herbalist……2		Q22TRT

	Hospital/health centre……..3 Faith healer……4 At home…….5 Soothsayer…….6 Other (specify)……99		
Q24	**Did you yourself give your child any medication when he/she had malaria?** Yes……1 No…….2	☐	Q23MEDCN
If NO, skip to question 26 **If yes, continue to Q25**			
Q25	**Where did you get the medicine you used to treat your child?** Pharmacy/chemical shop……..1 Hospital…….2 Herbalist……3 Home based care……...4 Spiritualist…….5 Health centre……6 Drug Peddlers.....7 Other (specify)……..99	☐	Q24PLMED
Q26	**What medicine(s) was given to you from where you sought treatment when he/she had malaria?** *(choose all that apply)* Paracetamol……..1 Herbs……2 Chloroquine……..3 Quinine……....4 Artesunate (Alazin)……...5 Artesunate amodiaquine……6 Amodiaquine……..7 Sulphadoxine pyrimethamine (fansidar)…….....8 Other, specify……99	☐	Q25MEDGV
Q27	**Apart from the medicine obtained in Q26, did you give your child any other preparation/concoction?** Yes……1 No…….2	☐	Q26OTHER
If NO, skip to question 29 **If yes, continue to Q28**			

Q28	Specify the medicine/concoction/preparation you gave your child. ……..... ……..... …….....		Q27SPEC
Q29	**How long did it take you to start treating your child for malaria?** Same day……1 2 days……...2 3days……3 4-6days.....4 1 week……..5 Other, specify……99	☐	Q28TIME
Q30	**How long did you spend at your source of treatment selected in Q20?** <10mins……1 10-30mins……2 30mins-1hour……3 1-6hours……4 The whole day……..5 Other, specify……..99	☐	Q29HLSH
Q31	**How long did it take you to get to the source of treatment selected in Q20?** <30mins…….....1 30mins-1hour...……...2 1hour-2hours……...3 >2hours……..……....4	☐	Q30HLTH
Q32	**What was the outcome of the treatment at the source of treatment in Q20?** Child was well……..1 Child was still sick……2 Child died……3 Other specify……99	☐	Q31DULT
Q33	**The medicine/preparation/ concoction obtained from your source of treatment in Q20, how did you administer/give it to your sick child?**	☐	Q32PRACT

	Use of enema……..1 Orally…….2 Bath the child with cold water/the medicine.....……..3 Inhale smoke from herbs……...4 Sprinkle water on the child……...5 Injection.....6 Incisions.....7 Rectum.....8 Other, specify……...99		
Q34	**Who normally takes the decisions in your household on where your child under five years should be taken to for treatment?** Father……1 Yourself…….2 Both.....3 Uncle……..4 Grandmother……..5 Neighbour……..6 Other, specify……99		Q32DECID

FOCUS GROUP DISCUSSION GUIDE

1. How is malaria called or known in this town?
2. How do you see malaria?
3. How do you think your child get malaria?
4. What kind of disease do you think malaria is?
5. Where do you take your child for treatment when he gets malaria? WHY?
6. Do you use herbs at any point to treat your child? What are the types you use? What do you use for you mixtures/concoctions?
7. How do you apply/give the concoctions and herbal preparations to your child?
8. Who decides on where you child is taken for treatment?