ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

CONCERN ABOUT HIV TESTING ON EARLY PRESENTATION AND TREATMENT OF MALARIA AMONG CHILDREN IN EAST SHEWA ZONE OF OROMIA REGION, ETHIOPIA

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Examiner

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List of Abbreviations

AAU	Addis Ababa University
ACTs	Artemisinin-based combination therapies
AIDS	Acquired Immuno-Deficiency Syndrome
CDC	Center for disease prevention and control
EPI	Expanded program on immunization
FGD	Focus group discussion
FMOH	Federal Ministry of Health
HC	Health center
HCT	HIV counseling and testing
HEP	Health extensionprogram
HEWs	Health extensionworkers
HP	Health post
IDI	In-depth interviews
IRB	Institutional review board
ITNs	Insecticide treated nets
KAP	Knowledge attitude and practice
MCLs	Malaria control laboratories
MIS	Malaria indicator survey
NGOs	Non-governmental organizations
OPD	Out patient department
ORHB	Oromia regional health bureau
PIHCT	Provider initiated HIV counseling and testing
RBM	Roll back malaria
RDTs	Rapid diagnostic tests
SSA	Sub-Saharan Africa
WHO	World Health Organization

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Abstract

Background:Malaria remains a major public health problem in the world with high burden of the disease in sub-Sahara Africa, mostly affecting children. Malaria accounts for high proportion of morbidity and mortality in Ethiopia and in East Shewa Zone of Oromia Region. To reduce this burden, early presentation and management is one of the priorityarea. Malaria diagnosis based on parasitological confirmation using microscopy/rapid diagnostic testing (RDT), which have similarity with human immune deficiency virus (HIV) test, is therefore increasingly advocated. However, concern of being tested for HIV can discourage community members from seeking biomedical solutions.

Objectives:to assess concernsabout HIV testingin delaying early presentation and treatment seeking ofchildren with malaria.

Methods: A facility-based cross-sectional design comprising mixed quantitative and qualitative research methods were conductedfrom October - November 2012 in five purposively selected health centers of East Shewa Zone. The source population were children under the age of 16 years with malaria symptoms in the districts and study population were < 16 years of age children who were suspected to have malaria and requested for malaria blood film test in the health center accompanied by caretakers. A total sample size of 836 (418 concerned and 418 unconcerned) mothers/caretakers and their childenwere included in the study. A pre-tested structured questionnairewas used and all clients were interviewed until the intended sample size was achieved. Data were entered using Epi-info version 3.5.3 and analysis was carried out using SPSS-16 statistical packages.Associations between dependent and independent variables were assessed and presented using odds ratios and 95% confidence intervals. Qualitative data were summarized manually and the result was triangulated across the groups.

Results: Of 830(412 concerned and 418 unconcerned with HIV testing) interviewed mothers/caretakers, about90% had knowledge on malaria and HIV diagnosis/testing and prevention while misconception on the two tests was also high. Nearly all(98%) of the concerned group thought that health workers would do HIV testing for people who give their blood sample for malaria testing in the health facilitycompared with only 4% of those unconcerned about HIV testing.About half(48%) of the concerned respondents believed that fear of HIV testing was the reason for people to stay away from seeking early diagnosis and treatment while only 11%of unconcerned caretakers agreed with idea. About 48% of children presented to health centers after 2 days of illness.Laboratory confirmed p-revalence of malariaamong study children was 20.5% with *P.vivax* constituting 57% and *P.falciparum* 41%.

Mothers/caretakers concern about HIV testing was independent predictor of malaria treatmentdelay among sick children [Adjusted odds ratio (AOR) = 1.84; 95% CI= 1.40-2.44].

Conclusions: Concern about HIV testing among the mothers/caretakers was associated with delay in presentation and treatment of children at health centers,and nearly half of the children were brought after two days of illnesses onset. High knowledge of malaria and HIV testing observed,yet misconceptions was also high.Moderate malaria prevalence with ***P.vivax***was observed in health facilities. Therefore, removing fear of HIV testing in the community and improving early treatment seeking behaviorfor malaria through delivery of appropriate and tailoredinformation, designing a better strategy and implementation by responsible bodies is recommended.

1.Introduction

1.1. Background

Globally there were estimated 216 million episodes of malaria in 2010, of which approximately 81% of cases, were in the African Region. There were an estimated 655,000 malaria deaths in 2010, of which 91% were in Africa. Approximately 86% of malaria deaths globally were of children under 5 years of age (1).Every second a child dies of malaria in the world (2).

In Ethiopia, malaria is one of the most important public health problems and ranked as the leading communicable disease in Ethiopia, accounting for about 30% of the overall Disability Adjusted Life Years lost. Approximately 68% of the total population of 78 million lives in areas at risk of malaria. According to Ethiopia's with more thanthree-quarters of the landmass of the country beingmalarious, and an estimated 68% (>50 million people) of the total population resides in areas atrisk of malaria infections (3).Annually, half a million microscopically confirmed cases of malaria are reported to the Federal Ministry of Health (FMOH) from basic health services. According to the FMOH malaria was the leading cause of outpatient visits, health facility admissions and inpatient deaths in 2007/2008, accounting for 12% of reported outpatient visits and nearly 10% of admissions(3).

Similarly,malaria in Oromia Region is also high that 64% of the land area being malarious,65.2% of the population of the Region is at risk of malaria. The malaria specific admissions and death rates of hospitals and health centers in the Region were 11.2% and 14.26% for the period 1999-2000, respectively (3).Malaria is also a major problemin East Shewa Zone during the peak transmission season from early September to mid December each year.

The Ethiopian Malaria Control and Prevention Strategy gives due emphasis for early diagnosis and prompt treatment. Malaria is one of the leading causes of illness and death among young children. Many children die each year in malaria endemic areas due to severe falciparum cerebral malaria, low birth weight, respiratory distress, hypoglycemia, severe anemia and/or repeated convulsions. Currently, a range of effective malaria control interventions are being scaled up in Ethiopia to improve access and equity to preventive as well as curative health services (4). Prompt access to early diagnosis and effective anti-malarial treatment at health facilities is one of the majorstrategies for reducing the burden of malaria in children and this also depends upon caretakers' perception and early recognition of symptoms and signs of malaria(1, 4).

1.2.Statement of the problem

Malaria is a major public health problem in Ethiopia, and poses a great threat to the health of children. The symptoms associated with malaria are relatively non-specific and include headache, sweats, lethargy, convulsions, fever, and vomiting(5). The problem is that these symptoms can also be caused by other illnesses as wellIt is thus imperative that diagnosis should be done promptly and appropriate treatment sought, otherwise severe illness and death may result(1, 4, 5).As anti-malarial drug costs are increasing, diagnostic methods are becoming a crucial component of malaria control strategy.Therefore, early presentation to health facilities with appropriate diagnostic methods is important to discriminate malaria-related symptoms from other diseases that also may require investigation and subsequently different treatment. Prompt parasitological confirmation by microscopy or RDT is recommended for all patients with suspected to have malaria, before treatment is started(1,4-6).

Infection with HIV is an emerging problem in Ethiopia and according to the Federal HIV/AIDS Prevention and Control Office, the single point HIV prevalence in 2007 was estimated to be 7.7% in urban areas and 0.9% in rural areas (7).To combat the problem of the disease, HIV counseling and testing (HCT), diagnostic HIV testing and provider initiated HCT (PIHCT) programs draw blood samples from finger pricking at health facilities which is similar with that of malaria blood test, and people usually decline to be tested for fear of social stigma, discrimination and fear of death. This may result in delay of treatment seeking of malaria patients due to fear of HIV testing at health facilities.

In Ethiopia delay presentation for teatment is a problem and is generally accepted that most malaria deaths can be prevented when clinical cases are promptly diagnosed and effectively treated (4, 5, 8). Malaria diagnosis using microscopy and RDT which have similarity with HIVtest is therefore increasingly advocated(9).However, some caregivers with reservations about RDTs for malaria, thinking they were HIV test kits and refuse to be tested(10). Fear of being tested for HIV discouraged community members from seeking biomedical solutions and fear that a positive test may result in guilt, abandonment, rejection, isolation, abuse or loss of job(11).There has been no study conducted yet in these important aspects of HIV/AIDS and malaria linkage. Therefore,this study assessedmothers/caretakers concern about HIV testing on early presentation and treatment seeking among childrensuffering from malaria. The expected outcomeof this study wasto createan insight on

the relationships between concern about HIV testing and delay in presentation to early diagnosis and treatment of children suspected to have malaria.

2. Literature review

2.1. Knowledge about malaria

Malaria is an intracellular parasitic disease transmitted by Anopheles mosquitoes bite and is caused by five species of parasites of the genus *Plasmodium* that affect humans *(P. falciparum, P. vivax, P. ovale, P. malariae* and *P. knowlesi),* malaria due to *P. falciparum* is the most deadly,and it predominates in Africa. *P. vivax* is less dangerous butmore widespread(1). Survey on knowledge, attitude and practice (KAP**)** of malaria in many countries shows that almost all the respondents heard about malaria (12-15).Majority of the respondents' recognized fever, vomiting, loss of appetite, joint pain and shivering (chills) as main symptoms of malaria in both adults and children (8, 16-19).The 2007 Malaria Indicator Survey (MIS) done in Ethiopia (8) shows majority of the community have an awareness of malaria.Among 4,438 surveyed women, 3,519 (79.5%) had heard of malaria; Some also stated back pain, headache, feeling thirst, fatigue and yellow urine(8,15-17). The most common symptoms locallyrecognized as being associated with malaria in children were fever (72%, 50%) followed by shivering /chills (60%, 61%) and few associated malaria with convulsion(16, 18, 19).

There is knowledge gap concerning the mode of transmission of malaria(20-25). Study on knowledge in Nigeria and India shows respondents who did not know the main cause of malaria were in the majority. Only 35% correctly identified mosquito bite as the main transmission method of malaria. Some of wrong perceptions on cause of malaria were lack of sanitation, sunlight, impure water etc(22, 23).Similarly, malaria was a serious medical problem results in death and being poor and the majority of respondents associated malaria with increased mosquito bites, and few blamed witchcraft(12).Those who know methods of prevention in different studies were similar (23, 26, 27) that about half of the respondents mentioned insecticide treated nets(ITNs) use.

2.2. Perception of malaria as a problem and self- medication

Malaria is considered as a serious problem to their children by symptoms they perceived as due to malaria.The most prominent symptoms were feeling hot, vomiting, refusal to feed, shivering and

behavior change (12, 27, 28).About half of the children received drugs at home; almost in all (96%) of the cases it was anti-malarial drugs, which was adequate (dose/duration) in 71% of them. Children receiving appropriate anti-malaria treatment at home show a tendency towards a lower case fatality (14). Malaria was thought as aproblem that59.3% of case felt that it was very serious, 39.4% felt that it was somewhat serious, 10.4% felt it was not serious at all and few indicated they did not know(22).The various reasons postulated for widespread self-medication revolve around inadequacies of healthcare facilities and delivery of services, including accessibility of the health-care facilities, cost, waiting time, and lack of drugs and social distance of health workers(27, 29).

2.3. Early treatment seeking behavior for malaria at health facilities

In India (20) the time of arrival at health facility was poor; of 200 respondents 166 (83%) arrived 3 days and above after fever and only 17% arrived within the first 24 hours after fever sought.In addition, study in Sir Lanka(27) on barriers to effective treatment shows similar time of arrival to health facility.In Vietnam (30) time of arrival at facility after fever onset was > 3 days.

Study on health seeking behavior in Malawi shows early health seeking for both younger and older children attending formal sector median was 6 days, while those attending informal sector was 4.8 days with fever (28).In Nigeria (29), half of the children presented within three days of illness, while the rest 50% of children presented after three days of illness.In Ghana study on mothers perception, attitude and acceptability of malaria shows > 60% believe to arrive at above 2 and more days for treatment (25). In Senegal study on from fever to anti malaria (31) indicates that majority of the < 5 children sought treatment within 48 hours of fever and some given artemisinin-based combination therapies (ACT) from public institutions. However, study done inSwaziland and Kenya shows that treatment seeking for malaria symptoms was < 2 days in majority of the cases (18, 32).Study on socio-culturaldeterminantsoftreatmentdelayforchildhood malariainsouthern Ghana (33) overall,only11.0%and33.0%ofthechildrenreceived proper treatmentwithin24and48hours,respectively, fromtheonsetofsymptomsofmalaria, whereas 67%ofthechildreneitherreceivingappropriate treatmentafter72hours,ornotreatmentatall and only few of them soughtappropriatetreatmentwithin24hours,and about one third within48hours.

Malaria indicator survey in Ethiopia(8)shows that treatment seeking time were poor in that only 16% of these children visited the health facility within 24 hours of onset of fever and 12% took an anti-malarial drug.A prospective hospital based study of severe malaria in under 5 children in Ethiopia (26) revealed that most of the children (80%) presented to the hospital in more than 24 hrs after the onset of the illness.Study done in Tigray, early treatment seeking to be only 32% (34).In southern Ethiopia(15),time interval between the onset of malaria illness and treatment seeking (from diagnosis to treatment initiation) at malaria control laboratories (MCLs)showsonly quarter of respondents visited the laboratories within two days while the remaining 74.5% came to MCLs after three or more days following the onset of illness. About 53% of those who came to MCLs three or more days after the onset of illness were from urban areas.

2.4.Factors associated with delays in presentation and treatment for malaria at healthfacilities

In Siri Lanka (27) most significantfactorfordelaywastakingdrugspriortocomingtothe out patient department (OPD), 38.3% of thoselivingwithin1kmdelayed treatment and self-treatment was associated with delaying treatment.Similar study also shows economic reason for delay treatment (29, 32).Study in Kenya shows that walking distance from health facility as a determinant factor, thus the closer the facility the earlier the treatment seeking and lower admission rate at hospital (35).Similarly, KAP study on malaria shows 60 minutes walking distance, lack of health education, being housewife are reasons for delay (34). A study done in Oromia and Amhara Regional States of Ethiopia(16) depicts that economic problems and distance of health facility are among the commonly reported reasons for delay to seek for medical care.In South West Ethiopia (36)mothers who had no history of child death were three times more likely to bring their under-five children late for the treatment of malariathan mothers who had history of child death and mothers who complained about the side effects of anti-malarial drugs shows strong association with treatment delay than their counter parts.In Southern Ethiopia (37)main reasons given for a delay in initiating treatment and visiting health services after onset of malaria were financial problems, health service inaccessibility, and mild illness.In East Shewa Zone, Ethiopia(15) study identified main reasons for delay of treatment seeking(three or more days) were mild illness, 44.2%; high workload, 19.9%; financial problems, 19.2% and thought of other diseases.

2.5. Knowledge and perception about the link between malaria and HIV testing

In China study of KAP on VCT shows that there was a knowledge gap of HIVtesting, fear of HIV testing for several reasons such as lack of confidentiality, stigma, and fear of being known by friends (38). The use of VCT related to occupation, age, transportation difficulties, health status, ethnicity, and high-risk behaviors. The main barriers to HIV testing includes perceiving oneself as low risk, fear of voluntary disclosure, and fear of stigma and discrimination that would result from taking the test (38). A facility based study in Uganda found that some caregivers had reservations about RDTs for malaria, thinking they were HIV test kits and concerns that their children could get infected with HIV in the process of undertaking an RDT and that the blood could be used to test children for HIV rather than malaria(10). There was fear that RDTs used at drug shops could be used to test for HIV when people have not consented to know their status. This may lead some clients to refuse test for malaria(39). The study done in Northwest Ethiopia also revealed that low awareness and stigma were the major reasons for non-acceptance of HIV testing(11).

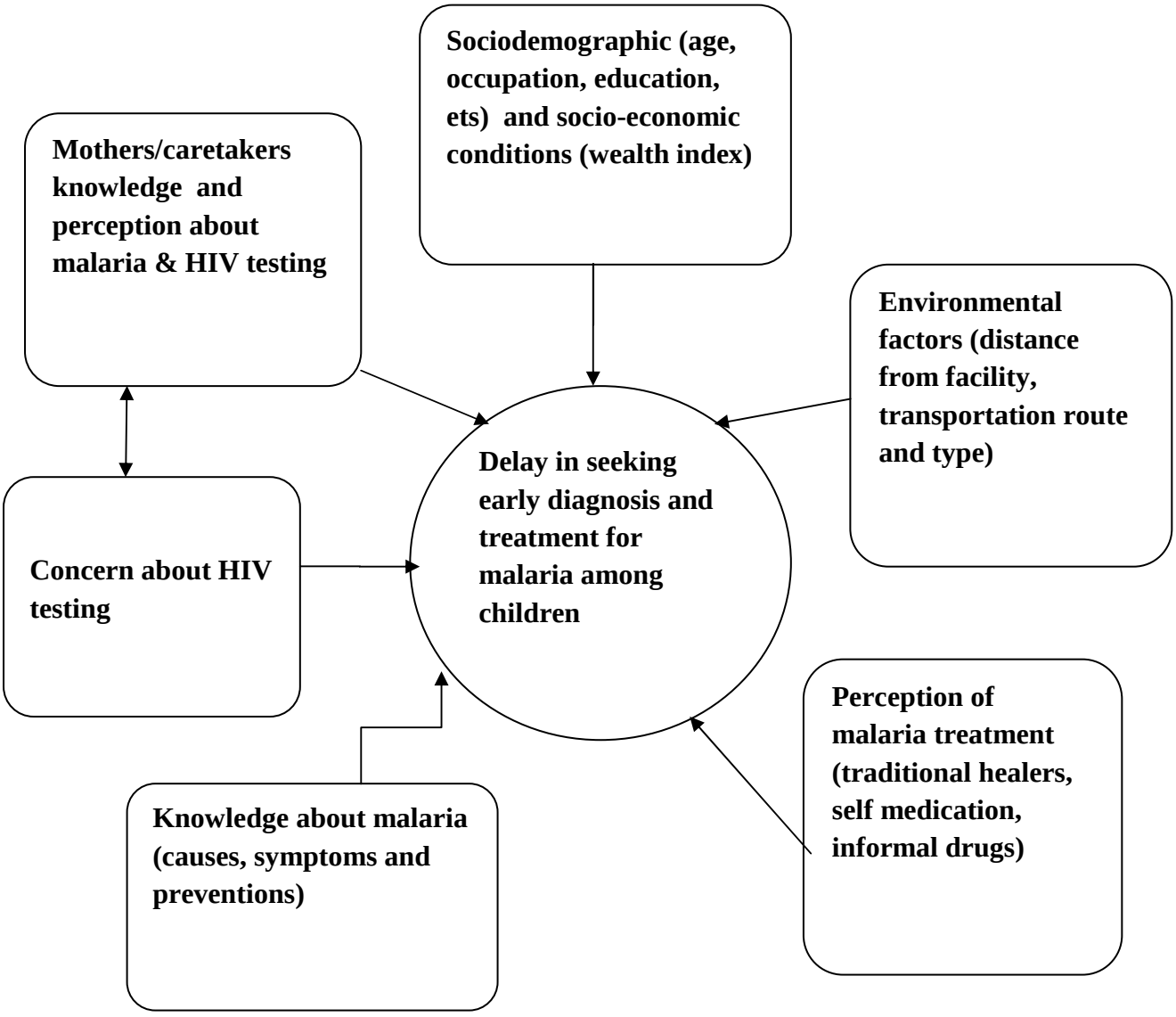


Figure 1:Conceptual framework of factors associated with delay in seeking early diagnosis and treatment for malaria in children

3. Objectives

3.1. General objectives

Toassess concerns aboutHIV testingon delaying early presentation and treatment seeking for malaria in children, East Shewa Zone, Oromia Region.

3.2. Specific objectives

- To assess the knowledge of mothers/caretakers on malaria and HIV blood examination of children
- To determine the prevalence of malaria among children who present with symptoms consistent with malaria infection and give blood for microscopic examination
- To assess the number of days between onset of illness and presentation to the health facility of children suspected to have malaria .
- To explore the association between delays in presentation/treatment seeking for malaria and concern about HIV testing at health facilities.

4. Subjects and methods

4.1.Study area and period

This study was conducted from September 2012 to June 2013 in East Shewa Zone of Oromia Regional State in Ethiopia. The Zone is divided into 13woredas (10 rural and 3 towns), which are further divided into 33 urban and 301 rural kebeles. The total population of the Zone in 2010/11 as projected based on the 2007 census data was 1,519,103 (51%males and 49%females). It has 3 hospitals,18 health centers and 296 health posts. The Zone is located in Great Rift Valley of East Africa and malaria was a major health problem in the zone in 2010/11 and one of the ten top diseases among the OPD visits.

Data were collectedfromfive health centers located in the ZonebetweenOctober andNovember 2012 aftercessation of the major rainy season. The health centers includedMojo, Meki, Batu, Bulbula, and Abosto (Shashemenne). Although Shashemene has been administratively located in East Shewa Zone for many years, according to the new administrative restructuring of the Oromia Region, it has been demarcated to the newly established West Arsi Zone in 2004/05 GC.The malaria situation and burden in the Zone shows that it was among major health problem with total annual malaria casesof 72,565 and total laboratory confirmed malaria was 25,999 with blood film positivity/ prevalence rate of 35.8% in the districts health centers and it was the third cause of OPD attendants in the 2011/12GC (2004 EC). In the health centers, diagnosis of malaria is based on clinical assessment and microscopic examination of blood films that guide the treatment,as there are different species of plasmodium. In case blood film negative the health professionals decide either to treat or not the patient under such condition and treat *P.falciparum* with Coartum and *P.vivax* with Chloroquine as afirst line drugs(2).

4.2.Study design

A health facility-based comparative cross-sectional design comprising of mixed quantitative and qualitative research methodswas used to address the study objectives. The study principally employed quantitative techniques based on questionnaire and qualitative methods using focus group discussion

(FGD) and in-depth interviews (IDIs) were employed to further explain and validate the quantitative findings.

4.3. Source population

The primary source populationwere children underthe age of 16 years with symptoms suggestive of malaria residing in the study districts. Other target groups include mothers/caretakers who resided in the study areas and malaria focal persons in the health centers.

4.3.1.Study population

The study population consists of all childrenunderthe age of 16 years who present with symptoms consistent with infection of malaria and gave blood for blood film examination at the health centers accompanied by their caretakers.

4.3.2.Sample size determination

4.3.3.Sample size for the quantitative study

In the month of September 2011, 130 microscopically confirmed malaria cases were identified at Batu Health Center, which represents approximately 30% of those who were tested and this is assumed to be similar in all the five health centers. As the malarial season lasts from September to December, this represents approximately 520 cases of malaria from the total 1700 suspected cases of malaria. Assuming that 50% of these werechildren under the age of 16 years, we decided to include 850 from the Health Center. Assuming a recruitment rate of approximately 20%, we required five comparable centers each providing 170 child respondents.

The main outcome measure of interest was the duration betweenmalaria symptoms onset to presentation at the health centre in those who have concerns about HIV testing compared to those who do not have any such concerns. Assuming that 50% of mothers/caretakers had concerns about HIV testing at the health facilities and 50% of children stayed at home for two or more days before visiting health center, we decided to use80% power to detect an absolute difference of 15% in those who had

concerns about HIV testing compared to those who had no concerns about HIV testing at the health facilities.

- **50%** of children with malaria symptoms among mothers/caretakers who had concerns about HIV testing had symptoms for two or more days
- **35%** of children with malaria symptoms among mothers/caretakers who have no concerns about HIV testing have had symptoms fortwo or more days
- Type I error (α) probability of 5% (two-tailed test), 95% confidence level
- Power of 80% (β=0.84) to detect at least a 15% difference between the two groups
- Design effect for cluster surveys, *DEFF* of2, was used as a multiplier to increase the sample size to account for the effect of the cluster sampling method related to the selection of health centers instead of simple random sampling.

After considering 15% non-responses and refusals, the total sample size required for each group is 418 children under the age of 16 years. This is obtained using epi-info software.

$$\frac{\left(Z1{-}\propto 2(\sqrt{\ P(1-P)}\ ) + Z1-\beta(\sqrt{po(1-po)+p1(1-po)})\right)\ 2}{(p_1\text{-}p_0)^2}$$

Where P= $(P_0+P_1)/2$, P_0=0.50, P_1=0.35 and power of 80%, i.e (1-β) =0.80, Z1-β=0.84

$$n=n2=\frac{(1.96(\sqrt{2(0.42)(0.58)}\ + 0.84(\sqrt{0.5(0.5)+0.35(0.65)})^2}{(0.35\text{-}0.50)^2}$$

no=n1, 182*2 design effect=364, 15% non-response rate, 54. A total sample size for each group was 418, making the overall sample of 836 children attending health center for malaria diagnosis.

4.3.4. Sample size for qualitative study

The quantitative study was complemented using FGDs and IDIs. The purpose of the qualitative study wasto collect information to better understand the concerns of HIV testing among malaria patients attending health centers help to fill the gaps inadequately addressed by the quantitative study. ThreeFGDs ofadults women with malaria symptoms wereconducted at three of the health centers.The number of participants in each FGD was7-8 people. Five in-depth interviewswereconducted with malaria focal persons one at each health center.

4.4. Sampling techniques

Ofthe 18 health centers in East Shewa Zone, five (Modjo, Meki, Batu, Bulbula and Shashemenne) werepurposively selected considering the high number of malaria patients visiting these health facilities in the Zone. The total sample size was allocated to each health center proportional to the total patients tested for malaria during the previous three months (June-August, 2012) prior to the the study. On average, 83children in each of the two groups werestudied in each health center. Qualitative study participants wereselected purposively to get in-depth information about concerns of HIV testing among malaria patients presenting to the health centers.

4.5. Inclusion and exclusion criteria

4.5.1 Inclusion criteria

All children <16years of age clinically diagnosed with malaria symptoms and requested for malaria blood film test at each health center during the study period

4.5.2 Exclusion criteria

- Children presented to the health center without being accompanied by their mothers/caretakers
- Critically ill children

4.6. Data collection

4.6.1. Quantitative data collection

A structured questionnaire was initially developed in English and then translated into local language (Afan Oromo) for data collection.The questionnaire comprised of identification and screening questions, sociodemographic characteristics, knowledge of malaria diagnosis and treatment, knowledge of HIV testing and concerns, treatment-seeking behavior for sick child and laboratory result.Thepre-test was done on 20 questionnaires for each study group in a Health Center that was not selected for the study to ensure its suitability for the study. One laboratory technician (data collector) and one supervisor from each Health Center were trained for two days on the data collection instrument, interview techniques and recruitment of the study subjects.

After clinical diagnosis made at OPD for the sick child, requested for blood test at the laboratoryand blood film sample was taken, mothers/caretakers were classified in to two groups based on the their response to the screening question, “Scared that the blood taken from your child for malaria diagnosis will also be used for HIV testing.”inquired at the laboratory. Those respondents who answered ‘yes’ for

the preceding question were classified as a group concerned about HIV testing while those who responded ‘no’ were considered as a group unconcerned about HIV testing to minimize the misclassification bias and interview were proceeded accordingly to preserve the validity.

The outcome variable was classified as ‘early’ and ‘delay’ in seeking treatment based on subjects arrival time at Health Centers for diagnosis and treatment of malaria suspected children from the time of illnessesonset. Children brought within the first 2 days (≤ 2 days) were considerd as early treatment seeking, whereasthose mothers/caretakers found to sought treatment for their children after 2 days were classified as delay treatment seeking based on previous studies conducted in the country (15)and other African and Asian countries(18, 20, 29, 32) for the comparision purposes since the sample size is too small in case the standard classification would be used.However, both at global and national levels early treatment defined as 24 hours of illness onset and both national and global targets were aimed at improving early treatment seeking as high as 80% with in the first 24 hours by the year 2010 (1).

Malaria parasite testingwasundertaken on children after blood sample taken from finger prick for a thick and thin blood films for microscopy. The test uses approximately 5 μl of blood and is readable after 15 minutes following the manufacturer’s guidelines.Blood slides, composed of thick and thin films, was taken from each participant by a medical laboratory technician. Slides were labelled and air-dried horizontally in a slide tray. Thin films were fixed in methanol immediately after drying. They were stained with 3% Giemsa for 30 minutes at each health center and blood slides were read and classified qualitatively as either negative, *P. falciparum* positive, *P.vivax* positive, or mixed infection.Every child visited the health centers suspected of having malaria was interviewed consecutively until the required sample size was obtained.The interview was takenplace after blood drawn from patients with malaria symptoms.

4.6.2. Qualitative data collection

Focas group discussionswereconducted with groups of 7-8 persons. The IDIs were conducted in each Health Henters with malaria focal persons. The moderator (i.e., principal investigator) and note taker conducted the qualitative data collection. The principal investigator also conducted IDIs. Both FGDs and IDIs were carried out using a discussion and in-depth guides that originally prepared in English and translated in to local language by principal investigator, respectively. With the consent of the participants, both sessioswereaudio taped and field notes taken. Socio-demographic characteristics of

the qualitative participants such as age, occupation, religion, marital status and education were also documented.

4.7. Variables

- **Dependent variables:**Number of days between onset of illness and presentation to the health facility for malaria diagnosis and treatment

- **Independent variables:**

- Socio-demographic characteristics: sex, age, educational status, religion, ethnicity, marital status, occupation, household conditions and possessions
- Distance to the health centre.
- Types of symptoms and duration of illness
- Individual's assessment of the likely diagnosis
- Microscopic diagnosis (Positive or Negative) and the types of species if positive
- Home management prior to coming to the health center
- Concerns about blood being tested for malaria as well as HIV
- Knowledge about HIV testing
- Attitude towards HIV testing
- Fear of HIV testing
- Perceived severity of malaria
- Perception on malaria testing
- Knowledge on malaria
- Reasons for delay

4.8.Data quality control

A data collection form was developed from OPD to laboratory request. Theprincipal investigator of the study controlled the overall activity through designing the proper data collection materials and through continuous supervisionon daily bases. Data collectors and supervisors were providedwith intensive training.

Questionnaire prepared in English was translated into Afan Oromo language for field workpurpose and back to English for checking language consistency by independent individuals.During the data collection process, the supervising data collector daily checked the questionnaires for completeness and incomplete or misfiled questionnaires were sent back to the respective data collector for correction. For the qualitative part, taking notes and audio recording was used to preserve its quality.

All completed data collectionformswere examined for completeness and consistency during data management, storage and analysis. Errors during data entry were corrected timely and again data cleaning andediting were given due attention.

4.9.Data entry, analyses and processing

Data entry, data cleaning and coding were performed using the Epi info software and then exported to SPSS version 16 for analysis. Development of data entry templates, data cleaning, processing, analysis and the overall management of the data were done by the principal investigator. Codebook, analysis and tabulation plans were developed in advance.Associations between dependent and independent variables were assessed and presented using odds ratios and 95% confidence intervals. Qualitative data were transcribed and translated. The data analysis wasincluded triangulation of data across groups.

4.10. Operational definitions

Malaria –an infectious disease characterized by chills, fever, sweating which is caused by plasmodium species.

Malaria testing – Microscopic or RDT blood film examination for malaria parasite

Lab confirmation of blood slides: Detection and specific identification of malaria parasites in blood films made from a sample of peripheral blood or detection of species specific parasite DNA in a sample of peripheral blood, using RDT

Malaria suspect─ a patient with fever or a history of fever in the past 24 hours and visited the health center

Household wealth index: measured by household possessions(electricity, radio, TV etc) and materials of roof of the households.

Knowledge of malaria:measured among respondents using five items: 1) knowledge of cause of malaria; 2) symptoms of malaria; 3) susceptible group for malaria; 4) prevention methods and 5) perception about malaria; and then sum up and calculated using SPSS

Knowledge of HIV testingand preventions ─measured by five items: 1) causes; 2) knowledge on HIV transmission; 3) availability of testingand 4) preventionsand then summed up and calculated using SPSS.

HIV testing –the detection of antibodies to human immunodeficiency virus using diagnostic tests

Concern about HIV testing –fear that the blood taken for malaria testing at the health center will also be used in HIV testing.

Delay in presentation – seeking treatmentbeyond two days or > 48 hours after fever in children

4.11.Ethical considerations

The proposalwas reviewed and approved by the Research and Ethics Committee of the School of Public Health and the Institutional Review Board (IRB) of the College of Health Sciences at Addis Ababa University. Permission to undertake this study was obtained from every relevant authority at all levels (Regional, Zonal and *Woreda* Health Offices). Sensitization about the studywas done at health center levels.An informed consent form was madeavailable to the study participants. For children <16 years, consent was obtained from a parent or guardian.

An informed consent form was made available to the study participants. For children under the age of 16 years, consent was obtained from a parent or guardian. The informed consent wasincluded statements of potential risk, benefits, likely breaches of confidentiality and how those werecurtailed. The consent form wasin line with the ethical principle of “autonomy” by including statements that give participants the right to decline participation in the study.Data collection instruments did no include names, address or any other identifying information. During the informed consent process, interviewers explained that the data collected would not be sharedwith anyone outside the research team to ensure confidentiality. The interview of each study participant took place in a separate room after they gave blood.

4.12.Dissemination of study results

The thesis will be presented to the School of Public at Addis Ababa Universityas partial fulfillments of the requirements for the Master Degree in Public Health and will also be communicated to the study Health Centers, Woreda Health Offices, East Shewa Zone Health Department and Oromia Health Bureau and finally to the Federal Ministry of Health. Findings will be presented on workshops, seminars and conferences of health professionals’ associations.Finally, it will be published in peer reviewed reputable journals.

5. Results

5.1 Background information

5.1.1: Socio-demographic characteristics of the respondents

In this study, 836 caretakers/mothers who met the set criteria were enrolled of which99.2 %(n=830) were interviewed. Six of the mothersrefused or interrupted the interview. Four hundred and twelve (49.6%) were concernedabout HIV testing while 418(50.4%) were unconcernedabout the testing. The study participants were from five health centers, namely Modjo (12%), Meki (23%), Batu (21.6%), Bulbula (19.3%) and Abosto (24%)health centers.

More than half (56.5%) of the participants were from urban and 361 (43.5%) were from rural areas. As shown in Table 1 most (68.3%) respondents were females and nearly half (46%) were in the age category of 25-34 years.The mean age of participants was 31.5 years. About 503 (60%) of respondents were mothers followed by fathers 213 (26%) while the rest 114 (14%) were brothers, sisters or others. About 699 (84%) of participants were currently married; of whom female household heads were 61 (7.3%). Nearly half (46%) of the respondents were Muslims; Orthodox Christianity accounted for 297 (35.8%) and Protestants were 112 (13.5%). The majority (70.5%) of the ethnic groups of the respondents were Oromo, followed by Amhara, 90 (10.8%) and Guraghe 57 (6.9%).

Table 1: Socio-demographic characteristics of the respondents, East Shewa Zone of Oromia Region, 2012

Variables	Concerned about HIV testing		Total
	Yes (n= 412)	No(n=418)	N=830
	Freq. (%)	Freq. (%)	Freq. (%)
Place of residence			
Urban	221(53.6)	248(59.3)	469(56.5)
Rural	191(46.4)	170(40.7)	361(43.5)
Sex of respondents			
Female	262(68.4)	285(68.2)	567(68.3)
Male	130(31.6)	133(31.8)	263(31.7)
Age category			
16-24 years	78(18.9)	79(18.9)	157(18.9)
25-34 years	197(47.8)	185(44.3)	382(46.0)
35-44 years	111(26.9)	120(28.7)	231(27.8)
>45 years	24(5.6)	36(9.0)	60(7.2)
Relationship to the sick child			
Mother	247(60)	256(61.2)	503(60.0)
Father	101 (24.5)	112(26.8)	213(25.7)
Brother	20(4.9)	20(4.8)	40(4.8)
Sister	25(6.1)	13(3.1)	38(4.6)
Others	19(4.6)	17(4.1)	36(4.3)
Sex of household head			
Male	376(91.3)	393(94.0)	769(92.7)
Female	36(8.7)	25(6.0)	61(7.3)
Current marital status			
Married	339(82.3)	360(86.1)	699(84.2)
Single	38(9.2)	31(7.4)	69(8.3)
Widowed	18(4.4)	15(3.6)	33(4.0)
Divorced	12(2.9)	11(2.6)	23(2.8)
Separated	5(1.2)	1(0.2)	6(0.7)
Religion			
Islam	186(45.1)	196(46.9)	382(46.0)
Orthodox	151(36.7)	146(34.9)	297(35.8)
Protestant	54(13.1)	58(13.9)	112(13.5)
Catholic	18(4.4)	14(3.3)	32(3.9)
Others	3(0.7)	4(1.0)	7(0.8)
Ethnic group			
Oromo	282(68.4)	303(72.5)	585(70.5)
Amhara	45(10.9)	45(10.8)	90(10.8)
Guraghie	28(6.8)	29(6.9)	57(6.9)
Hadiya	15(3.6)	14(3.3)	29(3.5)
Kambata	13(3.2)	6 (1.4)	19(2.3)

Others	29(7.0)	21(5.1)	50(6.0)

5.1.2: Socio-economic and household characteristics of the respondents

Regarding educational status of respondents, the illiteracy accounted for 284 (34.2%), those who can only read and write were 69 (8.3%), primary cycle 1 (1-4) were 133 (16%), primary cycle 2(5-8) were 169 (20.4%), secondary schools (9-12) were 123 (14.8%) and the rest were tertiary levels(Table 2). Concerning occupation of the caretakers the commonest ones were farmers,252(30.4%), housewife,209 (25%), and traders, 156 (18.8 %). The household possession of electricity and radio were 507 (61%) and 514 (62%) respectively. Nearly half (48%) of respondents' household had a telephone (both wireless and home phone), 299 (36%) had a television, 227 (27%) had a bicycle while 70 (8.4%) had a refrigerator. Most (75%) of the roof of household materials were corrugated iron (Table 2).

The nearest health facility to respondents home was health center, 467 (56.3%) followed by health post,322 (39 %). As to the distance of health center from respondents home, it was less than one-hour walk in 446 (54%); 30 minutes to less than 1 hour walk in 216 (26%); but only 29 (3.5%) takes 3 or more hours.The distance walked from home to nearest health post computed for those from rural areas shows that majority 269 (74.5%) of them walked less than an hour while only few of them walked 3 or more hours.

Table 2: Socio-economic and household characteristics of the respondents, East Shewa Zone of Oromia Region, 2012

Variables	Concerned for HIV testing		Total N=830
	Yes (n= 412)	No(n=418)	
	Freq. (%)	Freq. (%)	Freq. (%)
Highest levels of education			
Unable to read or write	143(34.7)	141(33.7)	284(34.2)
Can only read and write	30(7.3)	39(9.3)	69(8.3)
Primary Cycle 1 (1-4)	72(17.5)	61(14.6)	133(16.0)
Primary Cycle 2 (5-8)	91(22.1)	78(18.7)	169(20.4)
Secondary school (9-12)	58(14.1)	65(15.6)	123(14.8)
Tertiary levels	18(4.3)	34(8.1)	52(6.2)
Current main occupation			
Farmer	127(30.8)	125(29.9)	252(30.4)
House wife	109(26.5)	100(23.9)	209(25.2)
Trader	75(18.2)	81(19.4)	156(18.8)
Daily laborer	36(8.7)	35(8.4)	71(8.6)
Employed	24 (5.8)	46(11.0)	70(8.4)
Student	33(8.0)	25(6.0)	58(7.0)
Others	8(1.9)	6(1.4)	14(1.7)
Household possessions:			
Radio	266(64.6)	248(59.3)	514(61.9)
Electricity	247(60.0)	260(62.2)	507(61.1)
Telephone	192(46.6)	209(50.0)	401(48.1)
Television	128(31.1)	171(40.9)	299(36.0)
Bicycle	119(28.9)	108(25.8)	227(27.3)
Refrigerator	34(8.3)	36(8.6)	70(8.4)
Main material of household's roof			
Corrugated iron	300(72.8)	314(75.1)	614(74.0)
Thatched	112(27.2)	104 (24.9)	216(26.0)
Nearest health facility to home			
Health center	221(53.6)	246(58.9)	467(56.3)
Health post	166(40.3)	156(37.3)	322(38.8)
Private clinic	20(4.9)	13(3.1)	33(4.0)
Public/private hospital	5(1.2)	3(0.7)	8(1.0)

5.2: Knowledge and perception about malaria diagnosis and treatment

5.2.1: Knowledge of respondents about malaria causes, symptoms and prevention methods

Most (86.7%)of caretakers associated causes of malaria withmosquito bite,while232 (28%) cited hunger (or empty stomach), 155 (19%) cited eating maize stalk (Table 3).The commonly cited symptomsof malaria were fever, 766 (92.3%),headache 605 (72.9%), feeling cold, 561(67.6%), and thirsty, 557(67.1%).

A total of three FGDs and five IDIs conducted. Most of the respondents in IDIs stated that the community had high awareness for malaria eventhought there was a misconception. A 30 years old malaria focal male respondent from Modjo health center said:

> "*Eh… the awareness currently improved compared to the earlier times as there is a supportive government policy through employing HEWs who works on CDC especially malaria. Nowadays community asks about ITNs but utilization is a problem".*

Majority of the dicussants in FGDs associated malaia with mosquito bite while some linked with hunger, seasonality, dirty and stagnant water. They mentioned symptoms of malaria like fever, headache, vomiting, joint pain, etc. A 56 old widowed women discussant from Modjo FGD stated that:

> *"Malaria comes from, for example, dirty water collected at one site; if toilet gets dirty mosquitoes must come. If bad water left on grass, they surely come. However, we should cautiously discard dirty water. Symptoms are headache, back pain, poor appetite and fever."*

On methods how to protect oneself against malaria, majority, 739 (89%) of respondents cited sleeping under mosquito nets/ITNs, 458(55%) mentioneddraining of mosquito breeding sites, 387(47%) said keep house surroundings clean, 362 (43.6%)cited spray house with insecticide. Whereas,misconceptions like eating garlic, drinking alcohol, avoiding dirty food were cited by some groups of respondents Table (3).

Most of the mothers in FGDs were well aware about prevention of malaria that sleeping under mosquito nets/ITNs mentioned by the majority. In addition, avoid mosquito bite, spray chemicals, clean

environment, smoking near house ('equalaptus', 'tsid' and 'weyra zaf'), draining stagnant water, burning dry wastes. A women from Batu FGD aged 18 years stated prevention methods of malaria as:

"To prevent malaria we have to protect ourselves from mosquitoes. This is done by keeping our surrounding clean; we use ITN for high burden of mosquitoes; chemicals spraying and also going to health facilities for malaria blood test and taking prescribed drugs"

Table 3: **Knowledge about causes,symptoms of malaria and malaria susceptible groups, East Shewa zone of Oromia region, 2012**

Variables	Concerned for HIV testing		Total N=830 Freq. (%)
	Yes (n= 412) Freq. (%)	No(n=418) Freq. (%)	
Causes of malaria:			
Mosquito bite	352(85.4)	368(88)	720(86.7)
Hunger (empty stomach)	123(29.9)	109(26.1)	232(28)
Eating maize stalk	83(20.1)	72(17.2)	155(18.7)
Exposure to dirty swampy areas	69(16.7	64(15.3)	133(16.0)
Drinking dirty water	44(10.7)	69(16.5)	113(13.6)
Eating immature sugarcane	51(12.4)	44(10.5)	95(11.4)
Exposure to cold	40(9.7)	31(7.4)	71(8.6)
Witchcraft	8(1.9)	7(1.7)	15(1.8)
Did not know	3(0.7)	4(1.0)	7(0.8)
Others	1(0.2)	2(0.5)	3(0.4)
Symptoms of malaria:			
Fever	375(91)	391(93.5)	766(92.3)
Headache	286(69.4)	319(76.3)	605(72.9)
Feeling cold	287(69.7)	274(65.6)	561(67.6)
Thirsty	281(68.2)	276(66.0)	557(67.1)
Loss of appetite	199(48.3)	190(45.5)	389(46.9)
Vomiting	172(41.7)	202(48.3)	374(45.1)
Sweating	121(29.4)	156(37.3)	277(33.4)
Bitterness in mouth	151(36.7)	120(28.7)	271(32.7)
Nausea	126(30.6)	133(31.8)	259(31.2)
Body weakness	84(20.4)	82(19.6)	166(20.0)
Body ache/joint pain	60(14.6)	749(17.7)	134(16.1)
Diarrhea	11(2.7)	12(2.9)	23(2.8)
Did not know	4(1.0)	4(1.0)	8(1.0)
Others	1(0.2)	0 (0.0)	1(0.1)
Protection against malaria:			
Sleep under ITNs	372(90.3)	367(87.8)	739(89)
Drain mosquito breeding sites	227(55.1)	231(55.3)	458(55.2)
Keep house surroundings clean	190(46.1)	197(47.1	387(46.6)
Indoor residual spraying/IRS	164(39.8)	198(47.4)	362(43.6)
Avoid mosquito bite	90(21.8)	104(24.9)	194(23.4)
Eat garlic	74(18)	77(18.4)	151(18.2)
Smoking in the house	75(18.2)	74(17.7)	149(18.0)
Don't drink dirty water	32(7.8)	56(13.4)	88(10.6)
Did not know	3(0.7)	5(1.2)	8(1.0)
Others	50(20.0)	109 (12.7)	103(12.4)

The mothers/caretakers were inquired to mention groups of people to which malaria more serious, about two third of respondents cited under five years children; nearly half (45.4%) were cited pregnant mothers; about one third (32%) were said children while one-fifth (21%) of them said it is equally serious.

5. 2.2: Perception about malaria prevention, testing and treatment

Table 4 shows perception of malaria prevention, from the total respondents 809(97.5%) considered malaria as a major health problem.Nearly all (97%) of the respondents said malaria is curable disease. Seven hundred fifty six (91%) caretakers believed that malaria is transmitted by mosquito biteand almost all (99%) of them believed that it is important to seek treatment for malaria as soon as possible.About 86% of respondents disagreed with interruption of drug intake up on improvement. Nearly all(>97%) of the caretakers believed that use of IRS and sleeping under ITNs every night are an effective means of preventive measures.Almost all (97.3%) of the respondents knew that there is a test for malaria.

Table 4:Perception about malaria prevention and treatment, East Shewa Zone of Oromia Region, 2012

Variables	Concern for HIVtesting		Total
	Yes(n= 412	No(n=418)	N=830
	Freq. (%)	Freq. (%)	Freq. (%)
Malaria is a major health problem			
Yes	402(97.6)	407(97.4)	809(97.5)
No	10(2.4)	11(2.6)	21(2.5)
Malaria is treatable or curable disease			
Yes	395(95.9)	410(98.1)	805(97.0)
No	8(1.9)	3(0.7)	11(1.3)
Did not know/not sure	9(2.2)	5(1.2)	14(1.7)
Malaria is transmitted by mosquitoe bites			
True	370(89.8)	386(92.3)	756(91.0)
False	29(7.0)	16(3.8)	45(5.4)
Did not know/not sure	13(3.2)	16(3.8)	29(3.5)
Seeking treatment for malaria as soon as possible is important			
True	405(98.3)	414(99.0)	819(98.7)
False	7(1.7)	4(1.0)	11(1.3)
One can stop taking her/his malaria drugs as soon as he improved			
True	79(19.2)	37(8.9)	116(14.0)
False	333(80.8)	381(91.1)	714(86.0)
IRS is an effective means of malaria prevention			
True	397(96.4)	405(96.9)	802(96.6)
False	15(3.6)	13(3.1)	28(3.4)
Sleeping under ITNs every night is an effective means of malaria Prevention			
True	403(97.8)	413(98.8)	816(98.3)
False	9(2.2)	5(1.2)	14(1.7)
There is a test for malaria			
Yes	402(97.6)	406(97.1)	808(97.3)
No	5(1.2)	7(1.7)	12(1.4)
Did not know/not sure	5(1.2)	5(1.2)	10(1.2)

5.3: Mosquito nets/ITNs possession and utilization by households

Regarding households' current possession of ITNs, 421 (50.7%) had mosquito nets/ITNs of which 145(34.4%) households had one (39.4% concerned & 29.6% unconcerned), 205 (48.7%) two and the rest 71(17%) had three or more. The frequency of sleeping under ITNs every night in the last 15 days was 243(57.7%) and 240 (57%) were slept under ITNs last night. The frequency of sick child sleeping under ITNs every night in the last 15 days was 263(62.5%), and last night sleeping condition was259 (61.5%) (Table 5).

Table 5:Households' mosquito nets/ITNs possession and utilization, East Shewa Zone of Oromia Region, 2012

Variables	Concern for HIVtesting		Total N=830
	Yes(n= 412) Freq. (%)	No(n=418) Freq. (%)	Freq. (%)
Current ownershipof any ITNs by household			
Yes	208(50.5)	213(51)	421(50.7)
No	204(49.5)	205(49)	409(49.3)
Number of ITNs owned by household(n=421)			
One	82(39.4)	63(29.6)	145(34.4)
Two	96(46.2)	109(51.2)	205(48.7)
Three or more	30(14.4)	41(19.2)	71(16.9)
Frequency of sleeping under ITNsin the last 15 days (n=421)			
All nights	125(60.1)	118(55.4)	243(57.7)
Almost all nights	24(11.5)	26(12.2)	50(11.9)
Sometimes	39(18.8)	41(19.2)	80(19.0)
Only few nights	3(1.3)	5(2.3)	8(1.9)
None of the nights	17(8.2)	23(10.8)	40(9.5)
Slept under ITNslast night (n= 421)			
Yes	121(58.2)	119(55.9)	240(57.0)
No	87(41.8)	94(44.1)	181(43.0)
Frequentcy of the sick child sleeping under ITNs in the last 15 days(n= 421)			
All nights	133(63.9)	130(61)	263(62.5)
Almost all nights	9(4.3)	8(3.8)	17(4.0)
Sometimes	45(21.6)	37(17.4)	82(19.5)
Only few nights	5(2.4)	7(3.3)	12(2.9)
None of the nights	16(7.7)	31(14.6)	47(11.2)
Child slept under ITNs last night(n= 421)			
Yes	131(63)	128(60.1)	259(61.5)
No	77(37)	85(39.9)	162(38.5)

5.4. Knowledge, perceptionand practices about HIV testingand prevention

5.4.1: Knowledge of respondents about HIV/AIDS testing and prevention

Regarding knowledge on HIV, out of total interviewed individuals about half (49%) disagreed that a person could get HIV from mosquito bites,while 310 (37.3%) were agreed with the idea; the rest did not know whether a person could get HIV infection through mosquito bite or not.The majority (92%) of the respondents anticipateda possiblilitythat a healthy looking person could have HIV virus. Seven hundred fifty seven (91%) of caretakers cited abstinence from sex as one way to reduce HIV transmission; and 769 (93%) of them believed that, HIV can be transmitted from a mother to her baby. Nearly all (94.5%) of respondents believed that there is a test for HIV virus.

Most of the respondents from IDIs cited that the community have high awareness on HIV testing and prevention**.** Presence of provider initiated HIV counseling and testing (PIHCT) in most of the health facilities, schools, streets and market areas increased HIV testing knowledge, stated by malaria focal persons. On the other hand, misconception about HIV testing were mentioned, that some groups of the community thinks blood taken for malaria examination might also be used for HIV testing.A 42 years old cinical nurse malaria focal person at Batu health center stated that**:**

> ***"****I can say that the community has good knowledge on HIV. This is to mean first, this town eh…has many factories, daily laborers and have many hotels for travelers; HIV prevalence is high as compared to other cities in the rift valley. Therefore, they have high awareness comparing with the woreds' towns. Eh… health education provided in different times in schools and in meetings. In addition we teach in market areas that the community has high awareness."*

About 40% (56%; concerned, 24% unconcerned)of respondents believed that both malaria and HIV tests were similar, while 24%(21% concerned; 28% unconcerned) did not know or not sure of their similarity.

Majority of the FGDsbelieved that both malaria and HIV test done from blood and seen in microscopy; but the difference of the two tests were malaria blood taken from fingers while HIV blood taken from arms; others described the similarity.A 29 years married teacher respondent from Batu FGD stated:

"Nowadays both tests are the same. This is to mean previously HIV test performed from blood drawn from arms but now they started to draw blood from fingers like malaria and then soon the result be known using small instrument. Blood from arms can also be used for malaria test and blood from fingers be used for HIV test too. Therefore they are similar."

Regarding the places where a person could get a confidential test for HIV,majority(84%) of respondentscited government health center, 492 (59%)of them cited government hospital while private hospital, clinic and mobile VCT mentioned by some of the respondents (Table 6).

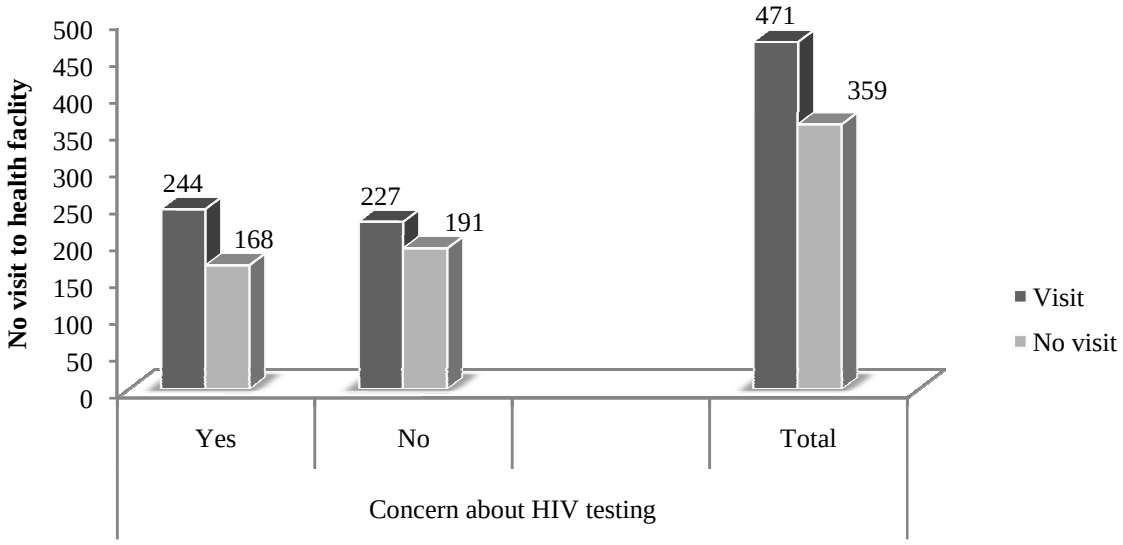
Table 6:**Caretakers knowledge about HIV/AIDS, East Shewa Zone of Oromia Region, 2012**

Variables	Concern for HIV testing		Total
	Yes (n= 412)	No(n=418)	N=830
	Freq. (%)	Freq. (%)	Freq. (%)
A person can get HIV from mosquito bites			
True	163(39.6)	147(35.2)	310(37.3)
False	191(46.4)	212(50.7)	403(48.6)
Did not know	58(14.1)	59(14.1)	117(14.1)
It is possible for a healthy looking to have virus			
True	317 (90)	390(93.3)	761(91.7)
False	24(5.8)	9(2.2)	33(4.0)
Did not know	17(4.1)	19(4.5)	36(4.3)
One way to reduce HIV is to abstain from sex			
True	373(90.3)	384(91.9)	757(91.2)
False	33(8)	27(6.5)	60(7.2)
Did not know/not sure	6(1.5)	7(1.7)	13(1.6)
HIV can be transmitted from mother to her baby.			
True	377(91.5)	392(93.8)	769(92.7)
False	16(3.9)	9(2.2)	25(3.0)
Did not know/not sure	19(4.6)	17(4.1)	36(4.3)
There is a test to know if one had HIV or not			
True	385(93.4)	399(95.5)	784(94.5)
False	13(3.2)	13(3.1)	26(3.1)
Did not know/not sure	14(3.4)	6(1.4)	20(2.4)
Blood testing for malaria and HIV were similar			
Yes	231(56.1)	102(24.4)	333(40.1)
No	96(23.3)	198(47.4)	294(35.4)
Did not know/ not sure	85(20.6)	118(28.2)	203(24.3)
Sites for HIV confidential testing			
Gov't health center	336(81.6)	364(87.1)	700(84.3)
Gov't hospital	257(62.4)	235(56.2)	492(59.3)
Private hospital	74(18.0)	84(20.1)	158(19.0)
Private clinic	79(19.2)	87(20.8)	166(20.0)
Mobile VCT units	92(22.3)	113(27)	205(24.7)
Did not know	8(1.9)	4(1.0)	12(1.4)

5.4.2: Perception and practices of HIV testing

Four hundred and seventy one (57%) of respondents visited health facility for themselves or for their sick children in the last 12 months (Figure 2), of which 285(60.5%) had been asked by health professionals in the health facility to give blood for HIV testing.Almost all of them who were asked for HIV test gave blood and found their result of HIV test.

The caretakers asked whether theyhave heard of any person in the community who was requested by a health worker in the health facility to give blood for HIV testing; 563 (68%) responded to have heard (80% concerned groups and 56%unconcerned groups).As to the acceptance of request of HIV test by health worker, 348 (83%) of the the unconcernedagreed to accept the request while little more than half (55.6%) of the concerned group intended to reject the request of the test.



Visiting to a health facility in the last 12 months by concern for HIV testing

Figure 2**:Mothers/ caretakers visiting to health facility in the last 12 months for themselves or their children, East Shewa Zone of Oromia Region, 2012**

5.5: Concerns about HIV testing in delaying malaria diagnosis and treatment

Table 7 summarizes concerns about HIV testing.Nearly all(98%) of the concerned group thought that health workers woulddo HIV testing for people who gave their blood sample for malaria testing in the health facility, while most(83%) of unconcerned groupdid not think it.The confidence that HIV testing would be done on a blood given for malaria testing at a health facility,44.6%(6.1%concerned vs 82.6%unconcerned) of respondents said not at all or only a little sure, about 15.5%(29% concerned vs 2% unconcerned) were somewhat sure, 30%(54%concerned vs 6%unconcerned)were very sure, the rest were completely sure or did not know, p.value <0.01.

Table 7:Concerns about HIV testing in delaying malaria diagnosis and treatment, East Shewa Zone of Oromia Region, 2012

Variables	Concerned about HIV testing		Total	P.value
	Yes(n= 412) Freq. (%)	No (n=418 Freq. (%)	N=830 Freq. (%)	
Confidence that HIV testing is done on a blood given for malaria testing at a health facility				
Yes	405(98.3)	18(4.3)	423(51.0)	< 0.01
No	3(0.7)	348(83.3)	351(42.3)	
Did not know	4(1.0)	52(12.4)	56(6.7)	
How much sure are you that you get an HIV test from blood sample for malaria at health facility				
Not at all or only a little sure	25(6.1)	345(82.6)	370(44.6)	< 0.01
Somewhat sure	121(29.4)	8(1.9)	129(15.5)	
Very sure	223(54.1)	26(6.2)	249(30.0)	
Completely sure	40(9.7)	6(1.4)	46(5.5)	
Did not know/not sure	3(0.7)	33(7.9)	36(4.3)	
The number of people in the community thinking that people who give blood sample for malaria test will also be tested for HIV				
None	5(1.2)	183(43.8)	188(22.0)	< 0.01
Only few	91(22.1)	62(14.8)	153(18.4)	
Many	238(57.8)	41(9.8)	279(33.6)	
Majority	50(12.1)	12(2.8)	62(7.5)	
Did not know /not sure	28(6.8)	120(28.7)	148(17.8)	
Heard about the community who didn't go to health facility for malaria testing due to fear of HIV test				
Yes	269(65.3)	84(20.1)	353(42.5)	< 0.01
No	94(22.8)	277(66.3)	371(44.7)	
Didnot know	49(11.9)	57(13.6)	106(12.8)	
Perceived that fear of HIV test in a health facility -delays people from treatment seeking for malaria				
Yes	196(47.6)	46(11.0)	242(29.2)	< 0.01
No	132(32.0)	254(60.8)	386(46.5)	
Did not know	84(20.4)	118(28.2)	202(24.3)	

About half of the discussants in FGDs disagreed with ‘blood sample for malaria could also be used for HIV testing in health facilities’ as HIV test could only be done with informed consent while others complained the inevitability of HIV testing for malaria patients giving their blood sample for testing. Few of them did not know whether the test would be done or not in the health centers. A 25 years old litrate and married woman who is daily laborer from Modjo town expressed her fear as:

> *“HIV test is must here even if you come for malaria blood test. The doctor himself wants to see HIV that when you visit health center repeatedly, he orders you to undergo HIV test. The test is becoming a must which is boring.”*

The respondents were inquired for the number of people in their communitywho perceived‘giving blood sample for malaria test at health facility would alsoresult in HIV testing’, nearly half (44%) of the unconcerned and only 1% of concerned groups said none;up to 18%(22% concerned, 15% unconcerned)said only few; 238 (58%) of concerned and only 41 (10%) unconcerned cited many people.Only 7.5%(10.4% concened, 2.6% unconcerned) saidmajority;whilethe rest 18%(7%concened, 29%unconcerned) of respondents did not know or not sure about the number of people in the community having such a case.Among total caretakers inquired, two third (65%) of concerned and 84 (20%) of unconcerned ones heard of any person in their community who did not go to health facility for malaria treatment due to fear of HIV test,whereas57 (13%)did not know the isssues (Table 7).

Most focal persons in IDIs and the discussants of the FGDs cited mixed perceptions on HIV in the community, as some group of the community have positive perception and undergo testing while other category have misconception on HIV testing. It was mentioned by most of the focal persons that relatively educated group, wealthiest classes, office workers and HIV positive individuals refuse or postpone the test while farmers, low socioeconomic classes, those who do not suspect themselves of having HIV easilyrequest for testing. A 42 years clinical nurse focal person from Batu health center stated that:

> *“Their perception about HIV test is different. When a bit educated part has fear and doubt about HIV test, they do not have interest to come here. Rather they prefer going far places like Adama, Zuway and Alam Tena. However, here especially farmers checked here though they have some awareness. Since we council them properly before blood test they easily accept and*

undergo blood test. There are two groups of people; half of them are volunteered and others refuse test."

Most of the discussants mentioned refusals of blood test at health facility; going back home up on request for blood test; fear of test due to similarity between the two tests. The rest groups of discussants cited, HIV test is must at public health facilities; wealthiest classes fear test and prefer distant private health facilities; some need only malaria test; fear of disclosure at health facilities; low awareness and taking malaria drugs secretly.A 29 years teacher discussant from Batu FGD pointed that:

"Eh…. I had a friend. She never wants to go to health facility for fear that she might be tested for HIV. She goes health facility with great pressure though she suffers from malaria or other diseases. She wants to buy & takes drugs. Unfortunately, she is not alive today. As she feared, she became positive. There is a fear in the community and prefers private clinics to public health centers "

Nearly half(48%) of the concerned respondents believed that fear of HIV testing in the health facility was the reason for people to delay from seeking early diagnosis and treatment while only 46 (11%)of unconcerned caretakers agreed with idea (Table 7).

Most of disscussants in FGDsstated fear of HIV testing in health facility as the reason for malaria treatment delay.They knew people who come late for treatment, took garlic, use wholly water, suffered from malaria at home, died at home and recommending separate test facility for HIV.A 25 years housewife discussant from Meki FGD said:

" In our area, there are many people who use garlic and ginger for malaria treatment; for fear that, they would be tested for HIV at health facilities. So for those who fear HIV test there must be separate malaria and HIV test"

5.6. Characteristics and treatment seeking behavior of children involved in the study

5.6.1 Sex and age categories of study children

Out of 830 children studied 423(51%) of them were males and 407(49%) of them were females. Concerning age categories of sick children, 99(12%) were in the age categories of < 2 years, 250(30%) were in the age group of 2-4 years, 291(35.1%) were in the age group of 5-9 years and the rest were in the age of 10-15 years with mean ageof 2.7 years.

5.6.2: Treatment seeking behavior for the children with current illnesses

Table 8 summarizes treatment-seeking behavior for the sick children. The respondents were inquired for the number of days their children spentat home with current illnesses before visiting the current health centers, only 198 (24%) of childrenvisited the health center within 24hours of illnessonset(15% concerned, 32% unconcerned).Aboutn 231 (28%)of children visited the health centers within 2 days of illnesses,237 (29%)of children were brought to the current health centerswithin 3 days of illness,while the rest164 (20%) were presented to the health centers after four or more days of current illnesses. The median was 2 days, p. value <0.01.

Table 8:Treatment seeking behavior for the child with current illness, East Shewa Zone of Oromia Region, 2012

Variables	Concerned about HIV testing		Total	
	Yes (n=412) Freq. (%)	No (n=418) Freq. (%)	N=830 Freq. (%)	P. values
Number of days spent from illness onset to first health center visit				
Within 24 hours	63(15.3)	135(32.3)	198(23.9)	< 0.01
Within 2 days	118(28.6)	113(27.0)	231(27.8)	
Within 3 days	126(30.6)	11(26.6)	237(28.6)	
Within 4 or more days	105(25.5)	59(14.1)	164(19.8)	
Main reasons delaying treatment seeking (n=626)				
Usually 1st wait & see	98 (28.3)	89 (31.8)	187 (29.7)	< 0.01
Not serious illness	87 (25.1)	87 (31.1)	174 (27.8)	
Lack of money	84 (24.3)	55 (19.6)	139 (22.2)	
No nearby health facility	25 (7.2)	22 (7.9)	47 (7.5)	
Fear of HIV testing	36 (10.4)	1 (0.4)	37 (5.9)	
Others (specify)	16 (4.6)	26 (9.3)	42 (6.7)	
The sick child sought advice or treatment before visiting the current health center				
Yes	77(18.7)	37(8.9)	114(13.7)	< 0.01
No	335(81.3)	381(91.1)	716(86.3)	
Place of advice/treatment for the sick child (n=114)				
Health Post	38(49.4)	12(32.4)	50(43.9)	0.014
Private clinics	24(31.2)	20(54.1)	44(38.6)	
Pharmacy/drug shop	10(13)	0 (0.0)	10 (8.8)	
Health centers	4 (5.2)	5 (13.5)	9 (7.9)	
Other (specify)	1(1.3)	0 (0.0)	1(0.9)	
The sick child took any drug during the current illnesses				
Yes	221(53.6)	186(44.5)	407(49.0)	0.031
No	190(46.1)	231(55.3)	421(50.7)	
Did not know	1(0.2)	1(0.2)	2(0.2)	
The sick child took any anti-malaria drugs during the current illnesses (n= 407)				
Yes	77(34.8)	60(32.3)	137(33.7)	0.420
No	129(58.4)	118(63.4)	243(60.7)	
Did not know	15 (6.8)	8(4.3)	23(5.7)	
Types of anti-malarial drugsthe sick child took(n=137)				
Chloroquine	31(40.3))	27 (45)	58(42.3)	0.370
Coartem	13 (16.9)	12 (20.0)	25 (18.2)	
Fansidar	7(9.1)	3(5)	10(7.3)	
Did not know	22(28.6)	18(30)	40(29.2)	
Others (specify)	4(5.2)	0 (0.0)	4(2.9)	
Reasons for bringing the sick child to this health center				
To get malaria testing	192(46.6)	242(57.9)	434 (52.3)	< 0.01
Conditions becoming worse	166(40.3)	141(33.7)	307 (37.0)	
Referral from other health personnel	22(5.3)	4(1.0)	26 (3.1)	
Others (specify)	32(7.8)	31(7.4)	63(7.6)	

Some discussants from FGDs believed to seek treatment soon to within 24 hours; a few of them said 2 days after illness begun while others cited 3 days. As a 34 years old woman from rural of Modjo FGD said:*"The right time for treatment is within three days. I came after three days of symptoms onset."*

Treatments seeking of the community for malaria sick children regarded as the problem of the country in general by most of focal persons. They stated that some visit health facility lately and after bed ridden while others seek treatment within time. A 25 years focal person from Modjo IDI stated as:

> *"It is a problem of the country; that means as a country the attitude towards early treatment seeking is a problem that only after bedridden they seek treatment. This is due to lack of early treatment seeking behavior but improved comparing with what is in the past."*

The main reasons cited for delaying in treatment seeking more than a day were usually first wait and see in 187 (30%) of cases, followed by less seriousness of illness174 (28%), and lack of money139 (22%). Some of the respondents also mentioned absence of health facility in the vicinity, fear of HIV testing, being bussy etc.

Most of the focal persons in IDIs mentioned distance of house hold from health facility, lack of money, fear of HIV test, wrong perception on blood testing, infrastructure inaccessibility, traditional drugs, poor service provisions, usually wait and see, etc. As a 34 years focal male person from Meki IDI said:

> *"There may be some people who do not come soon to health facility. Indeed, in this area part of the community uses traditional drugs and other things. Not only for malaria but also eh… devils they prefer wholly water and others. The other factor is distance; There is a delay due to distance for example some 'kebeles' were 40 kilometers away and it is them who come late 2-3 or 3-4 days delay but those in the catchment come soon within 1-2 days even within hours"*

Majorty (86%) of the mothers associated the current illness with malaria,whileonly 117 (14%)cited other diseases. Some of the diseases cited were common cold, tonsillitis, typhoid fever, HIV/AIDS etc. Of 830 respondents, majority (86%) did not seek advice or treatmentfor the sick child from any source before coming to the current health centers, while the rest 14%sought advice or treatment. These sites were health posts, private clinics, pharmacy/drugshops in50 (44%), 44 (39%) and 10 (9%) respectively.

Among caretakers who sought advice prior to visiting the current health center, 16 (14%) sought advice in less than a day; about 35 (31%) within one day; 37 (32.5%) within two days; 14 (12%)within three days and the rest were within four or more days (Table 8).

Four hundred and seven (49%) of the sick children took any drugs (54% concerned; 44% unconcerned)before visiting the current health facilities of which the antimalarial drugs accounted 137(34%).Of these anti-malaria drugs,58(42%) was chloroquine, 25(18%) was coartem, 10(7.3%) quinine and other drugs accouted for 4(2.9%)while 40(29%) of them did not know the type of drugs taken. The commonestreasons mentioned for bringing the sick child to thehealthfacilities was to get malaria blood testing in 434 (52%) of cases; followed by worsening of the condition in 307(37%) of cases, (Table 8).

5.7: Laboratory results of the sick child

Blood film was done for all (830) children included in the study. Almost all of the blood films were doneusing microscopy. The laboratory test result/malaria prevalence of the sick child was 170(20.5%) of which *P. vivax* accounted for more than half, 97(57%), *P. falciparum* accounted for 70 (41%) while the rest were mixed of both *species*.Regarding any medication prescribed by health workers in the health facility, majority (710; 85.5%) of them were given any drugs. All blood film positive children took anti malaria drugs of which chloroquine accounted for 102(60%), coartem accounted for 67(39%) while quinine accounted for the rest(Table 9).

Table 9:**Laboratory results of the sick child, East Shewa zone of Oromia region, 2012**

Variables	**Concerned about HIV testing**		**Total**	
	Yes (n= 412)	**No (n=418)**	**N=830**	
	Freq. (%)	**Freq. (%)**	**Freq. (%)**	**P. value**
Lab test result of the sick child				
Positive	89(21.6)	81(19.4)	170(20.5)	0.427
Negative	323(78.4)	337(80.6)	660(79.5)	
Plasmodium species (n=170)				
P. falciparum	38(42.7)	32(39.5)	70(41.2)	0.786
P. vivax	49(55.1)	48(59.3)	97(57.1)	
Mixed of both *species*	2(2.2)	1(1.2)	3(1.8)	
Sick child being prescribed any medication the health workers in the health facility				
Yes	360(87.4)	350(83.7)	710(85.5)	0.135
No	52(12.6)	68(16.3)	120(14.5)	
Child being prescribed anti-malarial drug (n=710)				
Yes	89 (25.0)	81 (23.0)	170 (24.0)	0.808
No	266 (73.9)	266 (76.0)	532 (74.9)	
Don't know/not sure	1(0.3)	1(0.3)	2(0.3)	
What antimalarial drug was prescribed (n= 176)				
Coartam	35(39.3)	32(39.5)	67(39.4)	0.773
Chloroquine	52 (58.4)	50 (62.0)	102 (60.0)	0.769
Quinine	4 (4.5)	0 (0.0)	4 (2.4)	0.056

5.8: Bivariate analyses

5.8.1: HIV concerns and other factors associated with delay in seeking treatment for children at health centers

Table 10 shows the results of binary logistic regression of socio-demographic and concern about HIV testing variables with duration of treatment seeking for malaria children. Crude odds ratio (COR) with 95% confidence intervals and p.values were computed. In bivariate analysis concern about HIV testing factors, residential areas, age groups of the sick children, mothers/caretakers educational status and distance from home to health facility were found to be significantly associated with treatment delay.

All concern about HIV testing variables computed to see association with treatment delay were shown significant association in that those mothers/caretakers who perceived that fear of HIV test in the health facility delays people from treatment seeking for malaria were about two times more likely to delay than their counter parts (COR= 1.82; 95% CI=1.31-2.52), p-value <0.01.Respondents who heard about people in the community who did not visit a health facility due to fear of HIV testing shows significant association with delay in treatment seeking for malaria children than the respondents who did not hear, (COR=1.45, 95%CI=1.08-1.95); significant at p<0.01.In the same analyses, those mothers/caretakers who were sure that HIV testing is done on a blood given for malaria testing at a health facility were delaying twice to bring their children for malaria treatment to the health facility than mothers/caretakers who were not sure about the test, (COR=2.18; 95% CI=1.64-2.90) and p-value< 0.01 (Table 10).

Table 10:Concerns about HIV testing and other factors associated in seeking treatment for children at health centers, East Shewa zone of Oromia region, 2012

Factors	Delay in seeking treatment for malaria among children		COR (95%CI)	p-value
	Yes	No		
Concerned about HIV testing				
Yes	230(55.8)	182(44.2)	**1.84(1.40-2.43)**	<0.01
No	170(40.7)	248(59.3)	1.00	
Perceived that fear of HIV test in facility delays people from treatment seeking for malaria(n=628)				
Yes	137(56.6)	105(43.4)	**1.82(1.31-2.52**)	< 0.01
No	161(41.7)	225(58.3)	1.00	
Heard people in the community who did not visit a health facility due to fear of HIV testing(n=724)				
Yes	184(52.1)	169(47.9)	**1.45(1.08-1.95)**	0.013
No	159(42.9)	212(57.1)	1.00	
Confidence that HIV testing is done on a blood given for malaria testing at a health facility(n=794)				
Sure	243(57.3)	181(42.7)	**2.18(1.64-2.90)**	< 0.01
Not sure	141(38.1)	229(61.9)	1.00	
Place of residence				
Rural	197(54.6)	164(45.4)	**1.57(1.19-2.08)**	< 0.01
Urban	203(43.3)	266(56.7)	1.00	
Age of children				
0-4 years	151(43.3)	198(56.7)	**0.64(0.45-0.92)**	0.015
5-9 years	146(50.2)	145(49.8)	0.85(0.59-1.23)	0.38
10-15 years	103(54.2)	87(45.8)	1.00	
Sex of children				
Female	197(48.4)	210(51.6)	1.00	0.90
Male	203(43.0)	220(52.0)	0.98(0.75-1.29)	
Educational levels				
No formal education	174(49.3)	179(50.7)	**1.53(1.06-2.21)***	0.024
Elementary school	158(52.3)	144(47.7)	**1.73 (1.18-2.52)***	0.005
Secondary & above	68(38.9)	107(61.1)	1.00	
Occupation of the mother/care taker				
Farmer	119(47.2)	133(52.8)	0.96(0.63-1.44)	0.84
Housewife	105(50.2)	104(49.8)	1.08(0.71-1.66)	0.71
Employed	107(47.3)	119(52.7)	0.96(0.63-1.47)	0.86
Unemployed	69(48.3)	74(51.7)	1.00	1.00
Household wealth index				
High	13 (7.6)	83(12.6)	1.00	0.08
Medium	70 (41.2)	258(39.1)	1.74(0.93-3.27)	
Low	87 (51.2)	319(48.3)	1.72(0.91-3.29)	
Distance from home to the health center				
< 1 hour walk	299(45.5)	363(54.5)	1.00	< 0.01
>=1 hour walk	101(60.1)	67(39.9)	**1.83(1.30-2.58)***	

*- statistically significant at p<0.05; **- statistically significant at p<0.01; COC- crude odds ratio; CI- confidence interval

5.8.2: Socio- demographic and other factors associated with delay in seeking malaria treatment for childen at the health centers, multivariate analyses

Tabele 11 shows various socio-demographic, socioeconomic, household condition, concern for HIV virusfactors; concern for HIV testing, age of sick children, educational status of mothers/caretakers and walking distance from home to the health centers were found to be associated with delay in seeking treatment for malaria children.

The odds of delaying in seeking treatment of malaria sick children among respondents concerned about HIV tesing were 1.84times more than those respondentsunconcerned about HIV testing(AOR= 1.84, 95% CI=1.40-2.44)after controlling for possible confounders.Regarding age categories of sick children, those children aged <5 years were 0.6times less likely to delay than those children aged 10-15 years (AOR=0.65, 95%CI=0.45-0.93) after an adjustment madewhereas children aged 5-9 years were not associated with treatment delay.Educational levels of respondents also shows association with delaying in seeking treatment for malaria sick children in bivariates, those who were unable to read and write and elementary schools were one and half times and about two times more likely to delay in visiting health facility for their children than those with higher education respectively. However, only those elementary schools became significant after an adjustment for possible confounding factors with AOR=1.54(95% CI=1.03-2.30).In addition, association observed with distance mothers/caretakers walked from their home to health center, those who walked more than an hour were nearly two times more likely to seek treatment after 2 days of illness onset than those caretakers who walked < 1 hour,(AOR=1.68; 95% CI=1.11-2.55), (Table 11).

The residential area of the childen shows association with delaying in binary analyses that children from rural area were about one and half times more likely to seek treatment after > 2 days of illness onset than children from urbansites, (COR=1.57; 95% CI=1.19-2.08), but lost association after controlling for potential confoundrers, and the household wealth index (economic status) of mothers/ caretakers were not associated with delay(Table 11).

Table 11:Selected sociodemographic factors and concern about HIV testing associated with malaria treatment delay, logistic regression, East Shewa Zone of Oromia Region, 2012

Factors for malaria among children	Delay in seeking treatment			
	Yes	No	COR (95%CI)	AOR (95%CI)
Concerned about HIV test				
Yes	230(57.5)	182(42.3)	**1.84(1.40-2.43)**	**1.84(1.40-2.44) ****
No	170(42.2)	248 (57.7)	1.00	1.00
Place of residence				
Urban	203(50.8)	266 (61.9)	1.00	1.00
Rural	197(49.2)	163(38.1)	**1.57(1.19-2.08)**	1.30(0.89-1.93)
Age categories of sick children				
< 5 years	171(37.8)	198(46.0)	**0.64(0.45-0.92) ***	**0.65(0.45-0.93)***
5-9 years	146(36.5)	145(33.7)	0.85(0.59-1.23)	0.83(0.57-1.21)
10-15 years	103(25.8)	87(20.2)	1.00	1.00
Educational levels				
No formal education	174(43.5)	179(41.6)	**1.53(1.06-2.21)***	1.30(0.84-2.00)
Elementary school	158(39.5)	144(33.5)	**1.73(1.18-2.52) ***	**1.54(1.03-2.30) ***
Secondary & above	68(17.0)	107 (24.9)	1.00	1.00
Household wealth index compared with the same community members				
High	116(29.0)	120(27.9)	1.00	1.00
Medium	120(30.0)	163(37.9)	0.76(0.54-1.08)	0.95(0.55-1.64)
Low	164(41.0)	147(34.2)	1.15(0.82-1.62)	1.28(0.79-2.09)
Distance of health center from home				
< 1 hour walk	299 (74.8)	363 (84.4)	1.00	1.00
>1hour walk	101(25.2)	67(15.6)	**1.83(1.30-2.58)***	**1.68(1.11-2.55)***

*- statistically significant at p<0.05; **- statistically significant at p<0.01; COC- crude odds ratio; AOR- adjusted odds ratio; CI- confidence interval

Table 12 shows association of knowledge index of malaria and HIV prevention and testing, practices and opinion about HIV testing, health seeking behavior and blood film results with treatment delay of malaria sick children.The association were observed for knowledge index ofmalaria, visiting to health facility for treatment in the past 12 months, acceptance of request for HIV test, seeking advice prior to visting health center, taking drugs before visiting the health facility and malaria laboratory results; while knowledge index for HIV testing, availability of malaria test, similarity between HIV and malaria tests and hearing of request of HIV testing in the community were not associated with treatment delay of malaria sick children(Table 12).

Table 12:Factors associated with treatment delay: knowledge, practices and opinion about malaria and HIV testing, health seeking behavior, a bivariate analyses,East Shewa Zone of Oromia Region, 2012.

Factors	Delay in seeking treatment for malaria among children		COR (95%CI)	P-value
	Yes	No		
Knowledge of malaria				
High	97(24.2)	134(31.2)	1.00	
Medium	128(32.0)	155(36.0)	1.41(0.80-1.62)	0.004
Low	175(43.8)	141(32.8)	**1.75(1.21-2.41)**	
There is a test for malaria				
Yes	389(97.2)	419(97.4)	1.00	0.86
No	11(2.8)	11(2.6)	0.93(0.40-2.17)	
HIV and malaria tests are similar				
Yes	164(41.0)	169(39.3)	1.00	0.61
No	236(59.0)	261(60.7)	1.07(0.81-1.42)	
Knowledge of HIV testing				
Good	350(87.5)	385(89.5)	1.00	0.35
Poor	50(12.5)	45(10.5)	0.81(0.53-1.25)	
Visit to health facility in the past12 months		217(50.5)		
Yes	254(63.5)	213(49.5)	1.00	
No	145(34.5)		**1.71(1.30-2.25)***	< 0.01
Heard in the community request by health workers in health facility to give blood for HIV				
Yes	280(70.0)	283(65.8)	1.00	0.19
No	120(30.0)	147(34.2)	1.21(0.90-1.6)	
Accept the request of HIV testing to a patient by a health worker				
Accept	256(64.0)	321(74.7)	1.00	< 0.01
Reject	144(36.0)	109(25.3)	**1.28(1.11-1.48)***	
Sought advice for the sick child				
Yes	95 (23.8	19 (4.4)	6.74 (4.0-11.3)	< 0.01
No	305(76.2)	411 (95.6)	1.00	
Child took any drug for current illness				
Yes	259(64.8)	148(34.4)	**3.50(2.63-4.66)**	< 0.01
No	141(35.2)	282(65.6)	**1.00**	
Malaria lab test result				
Positive	97(24.2)	73(17.0)	**1.57(1.11-2.20)***	< 0.01
Negative	303(75.8)	357(83.0)	1.00	

*- statistically significant at p<0.05; **- statistically significant at p<0.01; COC- crude odds ratio; CI- confidence interval

5.8.3: Factors assoctiated with delay in treatment seeking: knowledge on malaria and HIV prevention and testing, health seeking behavior and malaria lab results, multivariates

Table 13 shows various variables on knowledge and perception of malaria prevention and testing, HIV testing and perception, health seeking behavior of mothers/caretakers for their children and malaria blood film result.An association were observed for knowledge of malaria, those who responded to have visited a health facility in the last 12 months, those who decided to accept the request of HIV testing, sought advice, took any medications and malaria positive factors. No association observed for those who heard request for HIV testing in the health facilities.

The knowledge of respondents on malaria was found to be an independent predictor of treatment delay, subjects with low level of knowledge were about one and half times more likely to delay than those with high knowledge after adjustment (AOR=1.69, 95% CI=1.15-2.49).As to the mothers'/caretakers' history of visit to health facility in the past 12 months for illnesses, those who were not visited health facility in the past 12 months were about 1.3more likely to delay than caretakers who visited the health facility after adjustmentfor potential confounders(AOR =1.37 95% CI=1.01-1.86**).**Respondentswho decided to reject the request of blood for HIV test at health facility by health workers were 1.3 times more likely delaying treatment more than two days for malaria children as compared to those who agreed to accept the test request(AOR= 1.39, 95% CI= 1.03-1.95), (Table 13).

Seeking advice or treatment for the sick child prior to visiting the current health facility were strongly associated with delaying in treatment seeking; mothers/caretakers who were sought advice prior to visitinga health facility were about 5times more likely to come late than caretakers who did not seek advice (AOR= 5.08; 95% CI= 2.95-8.76). Moreover, the prior taking of drugs from other sources also shows strong association with treatment delay, those caretakers giving any drug to their children were about three times more likely to come late as compared to those who did not give any drug to their children(AOR =2.65; 95% CI= 1.95-3.61).The odds of delaying in treatment seeking among blood film positive children were approximatelyone and half timesmore thanthose who were blood film negatives after controlling for other variables(AOR=1.61, 95% CI=1.10-2.35), (Table 13).

Table 13:Factors associated with treatment delay: knowledge, practices and opinion about malaria and HIV testing, health seeking behavior, a bivariate and multivariates.East Shewa Zone of Oromia Region, 2012

Delay in seeking treatment for malaria among children				
Factors	**Yes**	**No**	**COR (95%CI)**	**AOR (95%CI)**
Knowledge of malaria				
High	97(24.2)	134(31.2)	1.00	1.00
Medium	128(32.0)	155(36.0)	0.99(0.67-1.47)	0.98(0.66-1.45)
Low	175(43.8)	141(32.8)	**1.75(1.21-2.57)***	**1.69(1.15-2.49)***
Visit to health facility in the past 12 months				
Yes	217(50.5)	254(63.5)	1.00	1.00
No	213(49.5)	145(34.5)	**1.71(1.30-2.25)***	**1.37(1.01-1.86)***
Heard in community blood request for HIV by health workers in health facility				
Yes	283(65.8)	280(70.0)	1.00	1.00
No	147(34.2)	120(30.0)	1.21(0.90-1.6)	0.90(0.65-1.24)
Do you accept or reject th request of blood for HIV test				
Accept	256(64.0)	321(74.7)	1.00	1.00
Reject	144(36.0)	109(25.3)	**1.28(1.11-1.48)***	**1.39(1.03-1.95)***
The sick child seek sought advice or treatment				
Yes	95(23.8)	19(4.4)	**6.74(4.0-11.3) ****	**5.08(2.95-8.76) ****
No	305(76.2)	411(95.6)	1.00	1.00
Child took any drug for current illness				
Yes	259(64.8)	148(34.4)	**3.50(2.63-4.66) ****	**2.65(1.95-3.61)** **
No	141(35.2)	282(65.6)	1.00	1.00
Malaria lab test result				
Positive	97(24.2)	73(17.0)	**1.57(1.11-2.20)***	**1.61(1.10-2.35)***
Negative	303(75.8)	357(83.0)	1.00	1.00

*- statistically significant at p<0.05; **- statistically significant at p<0.01; COC- crude odds ratio; AOR- adjusted odds ratio; CI- confidence interval

5.8.4: Factors associated with malaria prevalence

Table 14 shows selected socio-demographic and other factors by blood film result(positive or negative).Association with malaria blood film prevalence observed for duration of treatment, place of residence, perception on cause of illness and seeking advise before visiting variables while no association obtained for ITNs possession and utilization of households and sex of the sick child factors.

Table 14: Factors associated with malaria blood film prevalence in children, bivariate analyses, East Shewa Zone Oromia Region, 2012.

Factors Blood film result	Positive	Negative	COR(95% CI)	P-value
Delay in seeking treatment for malaria among children				
Yes	97 (24.2)	303 (75.8)	**1.57(1.11-2.2)***	< 0.01
No	73 (17.0)	357 (83.0)	1.00	
Place of residence				
Rural	87 (24.1)	274 (75.9)	**1.46(1.05-2.07)***	0.023
Urban	83 (17.7)	386 (82.3)	**1.00**	
Households' ITNs possession				
Yes	77 (18.3)	344 (81.7)	1.00	
No	93 (22.7)	316 (77.3)	1.24(0.95-1.65)	0.11
Sex of sick child				
Male	97 (22.9)	326 (77.1)	1.36 (0.97-1.91)	0.07
Female	73 (17.9)	334 (82.1)	1.00	
No of ITN per household (n= 421)				
One	28 (19.3)	117 (80.7)	1.00	
Two	31 (15.1)	174 (84.9)	0.77 (0.50-1.18)	0.14
Three or more	18 (25.4)	53 (74.6)	1.25 (0.7-2.22)	
Child's frequency of sleeping under an ITNs during the past 15 days (n= 421)				
Most of the nights	46 (16.4)	234 (83.6)	1.00	0.10
Some of the nights	20 (24.4)	62 (75.6)	1.64(0.90-2.97)	0.68
Few-none of the nights	11 (18.6)	48 (81.4)	1.17(0.56-2.41)	
Child slept under an ITN during the preceding night(n= 421)				
Yes	51 (16.2)	263 (83.8)	1.00	0.063
No	26 (24.3)	81 (75.7)	0.6(0.35-1.03)	
Percieved cause of illness				
Malaria	160 (22.4)	553 (77.6)	**3.10(1.58-6.06)**	< 0.01
Other diseases	10 (8.5)	107 (91.5)	1.00	
Advice sought before visiting health facility				
Yes	33 (28.9)	81 (71.1)	**1.72(1.10-2.69)**	0.016
No	137 (19.1)	579 (80.9)	1.00	

*- statistically significant at p<0.05; **- statistically significant at p<0.01; COC- crude odds ratio; CI- confidence interval

Table 15 shows selected sociodemographic and other factors by blood film result (positive or negative). The duration of treatment seeking is associated with positive result in that children of caretakers who were delayed for treatment of their sick children were 1.55 times more likely to be blood film positive for malaria than children of mothers'/caretakers' who came within the first 2 daysof illness onset to health facility (AOR= 1.55; 95% CI= 1.08-2.24).Reagarding residential area of the children, rurals were one and half times morelikely to be positive for malaria than children from urban area in bivariate analysis but lost their association after an adjustment with duration, nearest health facility etc factors (COR=1.46, 95% CI=1.05-2.07**)**, (Table 15).

Those children whose mothers/caretakers believed that the cause of the illnessof the sick child was malaria were threetimes more likely to be slide positive for malaria than their couter parts (AOR=3.09; 95% CI= 1.55-6.15). In addition, the children to whom advise or treatmenthad been sought before visiting the health facility were about 2 times more likely to be blood film positive than their counter parts, (COR= 1.72; 95% CI= 1.10-2.70)while the association lost after adjustmentfor potential confounders.Variables like households' wealth index, households' ITNs possession, did not show association both in bivariate and multivariate analyses (Table 15).

Table 15:Factors associated malaria prevalence in children, East Shewa Zone Oromia Region, 2012

Variables	Malaria Lab. Result		COR (95%CI)	AOR (95%CI)
	Positive	Negative		
Delay in seeking treatment for malaria among children				
Yes	97(24.2)	303(75.8)	**1.57(1.11-2.20)***	**1.51(1.05-2.176)***
No	73(17.0)	357(83.0)	1.00	1.00
Place of residence				
Rural	87(24.1)	274(75.9)	**1.46(1.05-2.07)***	0.74(0.48-1.13)
Urban	83(17.7)	386(82.3)	1.00	1.00
Household wealth index				
High	13(13.5)	83(86.5)	1.00	1.00
Medium	70(21.3)	258(78.7)	1.74(0.93-3.27)	1.16(0.57-2.40)
Low	87(21.4)	319(78.6)	1.72(0.91-3.29)	1.47(0.75-2.85)
Households'ITN possessions				
Yes	77(18.3)	344(81.7)	1.00	1.00
No	93(22.7)	316(77.3)	1.24(0.95-1.65)	1.42(0.99-2.02)
Percieved cause of illness				
Malaria	160(22.4)	553(77.6)	**3.10(1.58-6.06)***	**3.09(1.55-6.15) ****
Other diseases	10(8.5)	107(91.5)	1.00	1.00
Advice sought before visting				
Yes	33(28.9)	81(71.1)	**1.72(1.10-2.69)***	1.54(0.96-2.49)
No	137(19.1)	579(80.9)	1.00	1.00

*- statistically significant at p<0.05; **- statistically significant at p<0.01; COC- crude odds ratio; AOR- adjusted odds ratio; CI- confidence interval

6. Discussion

Early treatment seeking for children suspected of having malaria by their mothers/caretakers is an important measure in decreasing morbidity and mortality associated with delay. Ensuring prompt and effective treatment will prevent most cases of uncomplicated malaria from progressing to severe and fatal illness. To avoid this progression, treatment must begin as soon as possible, generally within 24 hours after symptom onset(1). Treatment delay for malaria is one of the major problems in malaria control and preventivestrategiesuntil recentlythough many determinant factors identified and explored to tackle the issues.

The current findings shows only quarter of malaria ill children visited the health facility within the first 24 hours illnesses onset that is consistent with other similar studies in Ethiopia and other countries(8,14, 15, 20, 30, 33) repoted only quarter or lower of the subjects were sought treatment within the first 24 hours of illnesses onset. However,the global targets of malaria prevention recommended that at least 80% of febrile children suspected to have malaria having access to and are able to use correct, affordable and appropriate treatment within the first 24 hours of onset of symptoms(1).This is far behind the global target, yet impossible to most of the SSA countries.Therefore, efforts to address this are urgently needed.

The delay between the onset of malaria illness and first visit to health facilies was about half of the casesin the current study that is consistent with Nigerian study which reported a delay of 53.7% (29). Lower delay observed in the current study as compared to study in East Shewa on treatment seeking of malaria patient where74% delay more than 2 days , and self-treatment of malaria in rural communities in Butajira where 63.6% came after two days of illness(15, 37), and the Indian study on knowledge of malaria were 83% delay(20). However, more delay observed in this study compared to study in Senegal where about 39% of children sought treatment more than 2 days (31) and only 16% delay three or more days in Kenya (32). The lower delay observed in this study may be due to the current areas better accessibility to health information and health facilities and improved health information delivery strategies through deployement of HEWs.

In this study area, main reasons cited for delayingearly presentation and treatment of malaria were absence of health facility in the vicinity, illness less serious, lack of money and usually waite and see, while few of them also cited fear of HIV testing. This is inagreement with various previous studies in Ethiopia and other countries (15, 16, 21, 37) cited distance from health facility, takingdrugspriorto visiting health facility, less serious illness and economic problems.

Concern about HIV testingwas found to be an independent predictor of treatment delay of malaria children; mothers/caretakers who have concern about HIV testing were more likely to delay>2 days from fever onset to their first seeking treatment for malaria sick children as compared to those who were unconcernedabout HIV testing.This is due to the fact that the current strategy to combat HIV prevalence involves blood examination of every individuals coming for any disease including malaria; unless refused otherwise at public health facility, that may result in fear of blood testing due to rejection by the community, might have hampered children from early seeking treatment for malaria. Likewise, study in Uganda (10) stated that malaria diagnosis using microscopy or RDT that have similarity with blood testing for HIV in procedure, specifically RDT's test kits have introduced fear of blood testing for malaria.This important findings on the relationships between malaria treatment delay and concern about HIV testing may help planners and researchers in designing tailored strategies in improving the early treatment seeking behavior through reducing fear of HIV blood testing in the health facilities.

Similarly, various HIVtesting perceptionfactors found to be associated with malaria treatment delay in bivariate anlaysis.Respondents who perceived that fear of HIV test in a health facility delays people from treatment seeking for malaria;those who heard about people in the community who did not visit a health facility due to fear of HIV testing and those who were sure that HIV testing is done on a blood given for malaria testing at a health facility were found to be identified as a factors delaying early presentation and treatment of malaria in children. Despite the fact that people suffers from malaria or other diseases, they fear HIV testing at public health facility and prefer to buy and take drugs from informal settings, seeking treatment from private health facilities or stay at home. In general, when some persons get sick there is a perception that blood taken for malaria test at public health facilities will also be used for HIV testing without their consent.

In line with concern for HIV testing, the current study identified various factors found to be associated with delaying in seeking treatment. Walking distance of >1 hour from home to health facility was associated with late presentation of children for treatment of malaria.Similarly, distance to a reliable health institution has been observed as a constraining factor in obtaining early and appropriate treatment(16, 34, 37).Due to long distance to the reliable health institution services and transport costs, many residents in Sub-Saharan Africa receive initial treatment of febrile illness at home.This could be explainedby the fact that they are unable to meet transport costs due to their low socioeconomic status and hence practicing homebased treatment with unprescribed drugs bought from drug sales/shops with unqualified sellers or consulting the nearest traditional healers.

In this study, the most striking factorsassociated with delaying were seeking advice or treatment andtaking any drugs before visiting to the current health facilities that is in agreement with similar studies conducted in Uganda andSri Lanka(12, 27). This may be associated with perception that the treatment sought could improve the condition and only after failure of these informal drugstreatment would be sought in health facilities; or else in adequate or inappropriate drugs might have been used.In addition, the above factors could be due to the fact that RBM encourages the population at risk of malaria to recognize the symptoms and initiate effective treatment at home(3).

Socio-demographic factor of the sick children also shows association with treatment delay. Less than five years children were brought to health centers earlier than older ones. This is in agreement with a Kenyan study(32)where children < 5 years tend to seek treatment earlier than older children in a factor of 3% difference (86% vs 83%).This is due to the fact that from the current findings the community had shown better understanding of severity of malaria in under 5 years children and pregnant mothers.Therefore,the priority was given to younger children by the community.

Though not strong, some association was observed between mothers/caretakers educational levels and treatment seeking behavior with those at elementary school (1-8 grades).They tend to delay more compared with higher levels of educationin this study which is in contrast with another study in south South West Ethiopia (36) that theeducational level of caretakers has no association with treatment delay. This might be associated with difference in educational levelsand the sample size used between

the the two studies that the former has somewhat higher educated subjects and the latter has small sample size.

Eventhough knowledge of malaria was not identified as an independent predictor of treatment delay in most of the former studies,having lower knowledge of malaria associated with delay in presentation and treatmentof malaria sick children inthis studywhich is consistent with study done inNigeria(21)that reported delay in seeking treatment for malaria was due to low knowledge of mothers of children.This is an interesting finding as it links knowledge of malaria with prompt treatment seeking for malaria children.Low knowledge may cause caretakers to be even unaware of both the vulnerability of children to malaria disease and how to practice appropriate homebased treatment which they prefer compared with seeking treatment at the nearest health institution. However, further study should be done to validate the findings.

The current study shows higher knowledge on transmission/cause of malaria comparing with other previous studies (8, 17, 21, 19) on malaria. This is due to the fact that, the respective areas selected for the study were malarious and known to have malaria transmission throughout the year; andrepeated access to malaria related awareness in the current study areas. Although majority of the respondents associated transmission of malaria with mosquito bite in this study, misconceptions such as hunger (or empty stomach), eating maize stalk and exposure to dirty swampy areas were commonly perceived as a cause of malaria that is similar with previous studies in Ethiopia (8,17,19). Nevertheless, studies in Nigeria and India on mothers perception identified that majority did not know the main cause of malaria and wrong perceptions on cause of malaria such as lack of sanitation, sunlight and impure water responded by some of the mothers (22, 23).

The results indicated that knowledge about the symptoms of malaria was very high. Almost all of the study subjects had knowledge of at least one of the classical symptoms. This is almost comparable with study done in central Ethiopia on knowledge, attitude and practice about malaria in a rural community and KAP study done on malaria in Swaziland (17, 18). However, better malaria knowledge observed in this study in comparisons with study done in Ghana(25) reported only 66.3% and India (20) reported only 49.5% of one or two classical symptoms of malaria. The knowledge about malaria symptoms is commonly high in malaria endemic areas where the community is aware of the clinical presentation of

the disease and also this may be associated with improved malaria prevention strategies and accessibility of the study sites to educational institutions.

Malariaprevention measures such as ITN use,draining mosquitoes breeding sites, keeping surroundings' clean and use of IRScommonly mentioned in this study which is higher than other studies conducted in Ethiopia and other countries (17, 19, 34), misconceptions like eating garlic, drinking alcohol, avoiding dirty food etc were also identified.The higher knowledge on malaria prevention observed in the current study may be due to the fact that, all other studies were conducted about a decade back, while currenty improved preventive strategies of house to house awareness creation through deploying HEWs was there,and slight difference in level of education of respondents.

The current study identified high perception of malaria prevention and testing, nearly all (97%) of the respondents believed that malaria as a major health problem, curable disease, importance of mosquito nets and IRS use, but they did not change this in to practice that their early treatment seeking was poor. Nevertheless, other KAP studies inDembia district(19), in Tigrai(34) and in Butajira(17)of Ethiopia shows lower perception of malaria prevention. This could be explained by the fact that the activities of Malaria Control Program to prevent and control the disease in the area for the last several years and the recent strategy that deployed HEWs for house to house awareness creation activities, might have enhanced their knowledge on the perception of malaria prevention and its preventive measures.

In the study area, highknowledge on HIV transmission & prevention observed compared with study conducted in Gambela on determinants for refusal of HIV testing(40). Here in this study, majority (>90%) of caretakers agreed that health looking person could have HIV virus, believed abstinence as a way of HIV prevention and knew mother to child transmission of HIV, while in Gambela about 70% had such a knowledge. This may be associated with better accessibility of study area to awareness creation facilities and more than half of the participants in the current study were from urban areas where people have improved access to information.

Although the subjects had high knowledge of HIV testing and prevention, there is a misconception on transmission of HIV virus in that nearly half of the mothers/caretakers found to associate HIV transmission with mosquito bite.This may lead them to be reluctant to blood testing for malaria and

HIV. In addition, this could be explained by the community's low awareness on the difference between HIV and malaria testing, as mentioned in-group discussion that some of the communities could not distinguish between the two tests.

The current study observed high knowledge on the availability of HIV testwith no difference between concerned and unconcerned groups that is consistent with study done in western Ethiopia, Gambela Region on determinants for refusal of HIV testing in pregnant mothers where about 94% of respondents agreed with availability of the test (40). Even though the community's knowledge of malaria and HIV test availability was high, enormousgap in distinguishing between the two tests was observedmore than half of the concerned groups and about quarter of unconcerned groups believed that the two tests were similar. This can be explained by the fact that, the methods used both for HIV and malaria blood drawing, testing and equipments(in case of RDT) use might be confusing and assuming that the two tests were similar.

Unless there is an ongoing malaria epidemic, careful laboratory testing typically reveals confirmed malaria parasites in fewer than 50% (probably in the range of 20-30%) of the clinically suspected malaria cases in most settings in Ethiopia (4). Similarly,a slide malaria prevalence in this study areawas 20.5%. This is in agreementwith theabove figure and national diagnostic confirmed malaria prevalence (18%), Malaria Operational Plan (MOP) Ethiopia FY2011:11 (3). Nevertheless, this result is lower than the blood film result of same Zone in 2010/11 in which 35.8% laboratory confirmed malaria cases; in Kola Duba district, a ten-year trend analysis of malaria prevalence (41)was 39.6%, and study on prevalence of malaria in Serbo district of Jimma Zone were 43.8% blood film positive for plasmodium (42). The lower slide positivity of plasmodium observed in this study may be explained by the fact that other febrile illness might have diagnosed as malaria;thereis giographical variation in malaria prevalences that the latter areas might have higher epidemic; the type of study design used; malaria diagnostic technique differences; skill of laboratory personnel variation in detecting the malaria parasites and current agrresive preventive strategies underway in the study area. The limitation of the current study is lack of laboratory quality control and therefore the future study should do verification and quality control.

In Ethiopia, the dominant plasmodium species during peak malaria transmission is ***P.falciparum***, 60% (4), whereas, the dominant species of malaria in the current study areas shows higher ***P.vivax*** that coincides with study done in south central Ethiopia, Woyessa et al (43) where about 83% of cases due to ***P.vivax***. It was reported from previous studies in south central Ethiopia that ***p.vivax*** predominance associated with resistance to chloroquine in the current areas and the dominant plasmodium species in the area was ***vivax***. Moreover, the relapsing feature of***P. vivax*** might have increased its prevalence in the study area during the investigation.

7. Strengths and limitations of the study

7.1. Strengths

- Design of the instrument and the field activities of the data collectors and the supervisors were closely observed; the data was entered, and cleaned thoroughly by the principal investigator.
- Use of two comparable groups
- Furthermore, combining quantitative and qualitative data used to triangulate the findingsare the strength the current study incorporated.

7.2. Limitations

- As the study is cross sectional, it lacks temporal relationships
- Health facilities were not selected randomly. Purposive sampling method was used considering health centers with high patient flow for malaria diagnosis and treatment that drawing firm conclusion about the whole zone could be difficult.
- Since the study enrolled the OPD attendents consecutively, it mighthave suffered from selection bias, thus affecting theinternal validity of the study.
- Since the study involved questions of personal sensitive issues related to HIV testing, it might have have been affected by social desirability bias.
- In addition, participants' self-report could have introduced misclassificationbias and recall bias.

8. Conclusions

Some of the conclusions from the current study findings are**:**

- Concerns about HIV testing strongly associated with delaying of malaria diagnosis and treatment and were identified as one of the factors delaying children from early seeking treatment for malaria at health facilities. Delaying was twice higher among caretakers who fear HIV testing for their children.The prevalence of concern for HIV testing was also high.
- Distance from health facility, knowledge index of malaria, seeking advice before visiting health facility, giving drugs prior to formal health seeking, age of sick children and educational status of mothers were found to be independent predictors of malaria treatment delay in children.
- Nearly half of the children sought treatment at the health centers after 2 days of illness onset,while only 24% of children sought treatment within the first 24 hours of illness onset.
- High knowledge of malaria prevention and testing observed; however, misconception is still there.
- Evnthough substantial no of mothers/caretakers had knowledge about HIV testing and prevention, low knowledge on distinguishing between HIV and malaria testing observed, and thinking that both tests were similar and blood drawn for malaria could also serve for HIV testing.
- Slide malaria prevalence in the study areawas similar with that of the country's, but*P.vivax*was the predominant species.

9. Recommendations

- To decrease fear of HIV testing in the community that results in malaria treatment delay, there is a need for properdesigningof a strategyanddelivery of appropriate and tailoredinformation.
- National, regional and district malaria prevention and control offices need to give emphasis onimproving early treatment seeking behaviors for malaria in children.
- To work onaltering mothers/caretakers wrong perception on HIV and malaria blood testing,andto remove these misconceptions through proper planning and implementation of strategies.
- To establish separate system for malaria and HIV testing in the health facilities that the burden of fear of HIV testing will be minimized and will also help in increasing early treatment seeking of malaria in children at health facilities.
- Some of the misconceptions described might modify the way community responds to malaria prevention and control. Therefore the need to freed these misconceptions by giving clear and continualmessages is obvious. Malaria related messages should focus on causes, means of transmission, blood testingand the definite possibility of cure.
- Conducting further studies on the relationships between concern about HIV testing and malaria treatment delay taking this study as a baseline.

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Annexes:

1: English version of Questionnaire

ADDIS ABABA UNIVERSITY SCHOOL OF HEALTH SCIENCE DEPARTMENT OF PREVENTIVE MEDICINE

Questionnaire designed to assess impact of fear of HIV testing on early presentation and treatment of malaria among children in East Shewa Zone of Oromia Region, Ethiopia

Questionnaire No: _____

Zone:_____ Woreda:_____

Name of the health center----------

I. Individual information sheet

Hello, my name is..... . I work for an institution named Addis Ababa University School of Public Health. I am one of the data collectors on the study with the above topic. I would like you to cooperate in answering the questions that follow. The information you will provide contributes to measures that are taken to control malaria.

Any information you provide will be confidential. You have the right to not to participate in the study.

Name of Interviewer: _____ Date: _ _/_ _/_ _

Start time: _ _/_ _ End time: _ _/_ _

II. Interviewer agreement

'I certify that I have filled this questionnaire in accordance with the training I was given and instructions stated in it. I have confirmed that the information in it is correct.'

Signed_____ date _____

Date----------/month----------/year----------

Name of data collector---------- signature----------

Interview date _ _/_ _/_ _

Name of supervisor----------signature----------

Date: _____

Are you willing to participate in the study? Yes _____ No _____Thank you

Fear of HIV Testing on Early Presentation and Treatment of Malaria among Children in East Shewa Zone of Oromia Region, Ethiopia

No.	Identifications	Response
1	Questionnaire number	
2	Region	
3	Zone	
4	Woreda	
5	Kebele	
6	Name of Health Center	
7	Name of interviewer	
8	Name of supervisor	
9	Date (dd/mm/yy)	/___/____/2005 EC

SCREENING QUESTION (Mothers/Caretakers of Children)

Are you scared of HIV testing when you visit a health facility for malaria diagnosis and treatment?

1. **Yes**
2. **No**

Section 1: Socio-demographic characteristics of the respondents

No.	Questions and filters	Response categories	Skip
1	What is your place of residence (rural/ urban)?	Rural 1 Urban 2	
2	Sex of interviewee:	Female 1 Male 2	
3	What is your (respondent) age in full years?	/_____/ Year	
4	What is your relationship to the sick child?	Mother 1 Father 2 Brother 3 Sister 4 Other (Specify)_____5	
5	What is the sex of the head of your household?	Male 1 Female 2	
6	What is your current marital status?	Married 1 Never married (single) 2 Divorced 3 Widowed 4 Separated 5	
7	What is your religion?	Islam 1 Orthodox 2 Protestant 3 Catholic 4 Other(specify) _____5	
8	What is your ethnicity?	Oromo 1 Amhara 2 Guraghie 3 Kambata 4 Hadiya 5 Tigre 6 Other(specify) _____ 7	
9	What is the highest level of school or grade you have completed?	Unable to read or write 1 Can only read and write 2 Primary Cycle 1 (1-4) 3 Primary Cycle 2 (5-8) 4 Secondary (9-12) 5 TVET (10+1 or 10+2) 6 TVET (10+3 /Diploma) 7 University Degree or Above 8 Other (specify)_____ 9	
10	What is your current main work/occupation?	Farmer 1 Housewife 2 Daily labourer 3 Government employee 4	

	• ***Choose only one response***	NGO employee 5 Trader 6 Student 7 Other (specify)_____ 8	
11	Does your household have: Electricity? A functional radio? A functional television? A functional telephone? A functional refrigerator? A functional Bicycle?	**Yes No** Electricity..... 1 2 Functional RADIO..... 1 2 Functional TELEVISION… 1 2 Functional TELEPHONE…1 2 Functional REFRIGERATOR…..1 2 Bicycle 1 2	
12	What is the main material of the roof of house of the household?	Thatched…….1 Corrugated iron .....2 Other (Specify)_____3	
13	What is the health care facility that is nearest to your home?	Health post 1 Health center 2 Public/private hospital 3 Private clinic 4 Don't know 5 Other (specify)_____ 6	
14	How far is this health center from your home?	Less than 30 minutes' walk 1 30 minutes – under 1 hour walk 2 1 hour to under 2 hours walk 3 2 hours to under 3 hours walk 4 3 or more hours 5 Don't know 98	
15	How many minutes does it take to walk to the health post where people in your community generally go to get malaria treatment?	Less than 30 minutes' walk 1 30 minutes – under 1 hour walk 2 1 hour to under 2 hours walk 3 2 hours to under 3 hours walk 4 3 or more hours 5 Don't know 98	

Section 2: Knowledge about malaria prevention and treatment

No	Questions and filters	Response categories	Skip
16	Do you consider malaria a major health problem in your community?	Yes 1 No 2	
17	What are the main signs and symptoms of malaria? • ***Multiple responses possible*** • ***Probe for possible answers (Anything else?)***	**YesNo** Fever 1 2 Feeling cold 1 2 headache 1 2 Sweating 1 2 Nausea 1 2 Vomiting 1 2	

		Loss of appetite 1 2 Bitterness in the mouth 1 2 Body weakness/tiredness 1 2 Body ache/joint pain 1 2 Thirsty 1 2 Diarrhea 1 2 Don't know 1 2 Other (specify)_____	
18	• In your opinion, what causes malaria?***Multiple responses possible*** • ***Probe for possible answers (Anything else?)***	Mosquito bite 1 Eating immature sugarcane 2 Eating maize stalk 3 Hunger (empty stomach) 4 Exposure to cold or changing weather 5 Drinking dirty water 6 Witchcraft 7 Exposure to dirty swampy areas 8 Don't know 10 Other (specify) _____ 11	
19	For which group of the population do you think malaria is more serious? • ***Multiple responses possible*** • ***Probe for possible answers (Anything else?)***	Adults ……. 1 Children under 5 years old…. 2 Children ……. 3 Pregnant women……. 4 Elderly ……. 5 Equally serious for all……. 6 Don't know or not sure……. 7	
20	How can someone protect themselves against malaria? • ***Multiple responses possible and circle all responses that apply*** • ***Probe for possible answers (Anything else?)***	Sleep under a mosquito net/ITNs……1 Avoid mosquito bites……2 Spray house with insecticide……3 Drain mosquito breeding sites around the house 4 Keep house surroundings clean…..5 Smoking (burn leaves/cow dung) in the house .6 Don't drink dirty water…..7 Don't eat bad food (immature sugarcane/leftover food)….8 Put mosquito screens on the windows….9 Eat garlic….10 Drink alcohol…11 Don't know 12 Other (Specify)_____13	
21	Is malaria a preventable disease?	Yes 1 No 2	

		Don't know or not sure 3	
22	Is malaria a treatable/curable disease?	Yes 1 No 2 Don't know or not sure 3	
23	Malaria is transmitted from one person to another by the bite of infective mosquitoes	True 1 False 2 Don't know/not sure 3	
24	It is important to seek treatment for malaria as soon as possible	True 1 False 2	
25	One can stop taking her/his malaria drugs as soon as she/he starts feeling better	True 1 False 2	
26	Indoor residual spraying is an effective means of malaria prevention	True 1 False 2	
27	Sleeping under a mosquito net/ITNs every night is an effective means of malaria prevention	True 1 False 2	
28	Does your household currently have any mosquito nets/ITNs that can be used while sleeping?	Yes 1 No 2	**→34**
29	How many mosquito nets/ITNs does your household currently have [both used and unused]?	/_____/	
30	How frequently did you sleep under mosquito net/ITNs within the last 15 days?	All nights 1 Almost all nights 2 Sometimes 3 Only few nights 4 None of the nights 5	
31	Did you sleep under mosquito net/ITNs last night?	Yes 1 No 2	
32	How frequently did the sick CHILD sleep under mosquito net/ITNs within the last 15 days?	All nights 1 Almost all nights 2 Sometimes 3 Only few nights 4 None of the nights 5	
33	Did the sick CHILD sleep under mosquito net/ITNs last night?	Yes 1 No 2	

Section 3: Knowledge about HIV/AIDS Prevention and Testing

I would now like to ask you a few questions about your chances of getting HIV/AIDS

No	Questions and filters	Response categories	Skip
34	A person can get HIV from mosquito bites.	True 1 False 2 Don't know/not sure 3	

35	It is possible for a healthy looking person to have the virus that causes AIDS.	True 1 False 2 Don't know/not sure 3	
36	One way to reduce chances of contracting HIV is to abstain from sex.	True 1 False 2 Don't know/not sure 3	
37	HIV can be transmitted from a mother to her baby.	True 1 False 2 Don't know/not sure 3	
38	There is a test that a person can take to determine if he (or she) has HIV, the virus that causes AIDS	True 1 False 2 Don't know/not sure 3	 **→40** **→40**
39	Where can a person get a confidential test to find out if he (or she) is infected with HIV? • **CIRCLE ALL THAT APPLY**	Govt health center 1 Government hospital 2 Private hospital 3 Private clinic 4 Mobile VCT units 5 Don't know/not sure 6 Other (specify) _____ 7	
40	At any time in the past 12 months, have you visited a health facility for treatment of your illness/sickness?	Yes 1 No 2	 **→44**
41	If YES to Q40, have you been asked by a health worker to give a blood for HIV testing?	Yes 1 No 2	 **→44**
42	If YES to Q41, did you give your blood for HIV testing?	Yes 1 No 2	 **→44**
43	Please don't tell me the result, but did you find out the result of your test?	Yes 1 No 2	
44	Have you heard of any person in your community who was requested by a health worker in the health facility to give a blood for HIV test?	Yes 1 No 2	
45	In your opinion, do you accept or reject the request of a patient by a health worker in the health facility to give blood for HIV test?	Accept 1 Reject 2 Don't know/not sure 3	

Section 4: Concerns about HIV Testing in Delaying Malaria Diagnosis and Treatment

No	Questions and filters	Response categories	Skip
46	Is there any test that a person can take to determine if he (or she) has malaria?	Yes 1 No 2 Don't know/not sure 3	
47	Is a blood test for malaria and HIV test similar**?**	Yes 1 No 2 Don't know/not sure 3	

48	Do you think that health workers do HIV testing for people who give their blood sample for malaria testing in the health facility?	Yes 1 No 2 Don't know/not sure 3	
49	How sure are you that you would get an HIV test if you give your blood sample for malaria testing at health facility?	Not at all sure 1 Only a little sure 2 Somewhat sure 3 Very sure 4 Completely sure 5 Don't know/not sure 6	
50	How many people in your community believe that people who give blood sample for malaria test will also be tested for HIV?	None 1 Only few 2 Many 3 Almost all 4 All 5 Don't know/not sure 6	
51	Have you heard of any person in your community who did not go to health facility for malaria testing due to fear of HIV test?	Yes 1 No 2 Don't know/not sure 3	
52	Do you think that the fear of HIV testing in the health facility is the reason for people to delay from seeking early diagnosis and treatment for malaria at the health facility?	Yes 1 No 2 Don't know/not sure 3	

Section 5: Treatment Seeking Behavior for the Child with Current Illness

No	Questions and filters	Response categories	Skip
53	What is the sex of the **sick child**?	male 1 female 2	
54	How old is the sick child in full years?	/_____/ Year	
55	**How many days ago did the current illness of the child start?** • ***If less than one day, record "00"***	**Days ago.....** **Don't know…..……98**	
56	In your opinion, what is the cause of your child's current illness? • ***Only one answer***	Malaria 1 HIV/AIDS 2 Other(specify)_____3	
57	Did you seek advice or treatment for the **sick child** from any source before coming to this health center?	Yes 1 No 2	**→60**
58	If YES for Q57, where did you seek advice or treatment	Health post 1	

	for the child?Anywhere else? • ***Record all sources mentioned***	Health center 2 Private clinic 3 Pharmacy/drug shop 4 Govt/private hospital 5 Other (specify)_____6	
59	How many days after the current illness began did you first seek advice or treatment for the **sick child**? • ***If less than one day, record "00"***	Days _____	
60	At any time during the current illness, did the **sick child**take any drugs?	Yes 1 No 2 Don't know/not sure 3	 ***→63*** ***→63***
61	At any time during the current illness, did the **sick child** take any ANTIMALARIAL DRUG?	Yes 1 No 2 Don't know/not sure 3	 ***→63*** ***→63***
62	What ANTIMALARIAL DRUG did the **sick child** take? • **Probe (Any other drug?)** • ***Record all responses***	CoArtem 1 Chloroquine 2 Quinine 3 Fansidar 4 Don't know 9 Other (specify) _____ 10	
63	What was the reason for bringing the **sick child**to this health center?	Condition becoming worse 1 Referral from other health personnel 2 To get malaria testing 3 Others (specify)_____4	
64	How many days after the start of the illness did the child come to this health center? • ***If less than one day, record "00"***	Days _____	
65	If the duration for Q64is >1day, what was the main reason for the delay in seeking treatment?	Lack of money 1 Fear of HIV testing 2 Not serious illness 3 No nearby health facilities4 Usually first wait and see 5 Others (specify)_____ 6	

Section 6: Laboratory Results of the Sick Child

No	Questions and filters	Response categories	Skip
66	Is blood film done for the child with the current illness to test for malaria parasites?	Yes 1 No 2	→70
67	What diagnostic tool was used to test the blood film of the **sick child** for malaria?	Microscopy 1 RDT 2	
68	What was the laboratory test result of **the sick child**?	Positive 1 Negative 2	→70
69	What was the *Plasmodium s*pecies responsible for the illness?	*P. falciparum* 1 *P. vivax* 2 Mixed of both 3 Other (specify)_____4	
70	Is the **sick child** being prescribed any medication by the health worker in the health facility?	Yes 1 No 2	→STOP
71	Is the **sick child** being prescribed any ANTIMALARIAL DRUG?	Yes 1 No 2 Don't know/not sure 3	→STOP →STOP
72	What ANTIMALARIAL DRUGwas prescribed for the **sick child**? • ***Probe (Any other drug?)*** • ***Record all responses***	CoArtem 1 Chloroquine 2 Quinine 3 Fansidar 4 Don't know 5 Other (specify) _____ 6	

That is the end of our interview. Thank you very much for taking time to answer our questions!!

	Name	Signature	Date
Data collector	_____	_____	_____
Supervisor	_____	_____	_____

2:Afaan Oromo Version ofthe Questionnaires

ADDIS ABABA UNIVERSITY SCHOOL OF HEALTH SCIENCE DEPARTMENT OF PREVENTIVE MEDICINE

QUESTIONNAIRES (AFAAN OROMO VERSION)

Unkaa gaaffilee dhiibbaa shakkii qorannoo HIV tiif jecha yeroon yaala barbaachuu dhabuu ijoollee dhukkuba busaa qabaniif, Godina Shawa Bahaatti, Itiyoophiyaa.

Lakkoofsa unkaa gaaffii: _____

Godina:_____ Aanaa:_____

Maqaa buufata fayyaaa ----------

I. Unkaa odeefannoo dhunfaa

Heloo, maqaan koo.....Ani dhabbata Yunivarsiitii Finfinnee kutaa Fayyaa Hawaasummaatiif hojjadha. Mata duree gubbatti eerame irratti namoota daata sassaaban keessaa tokkoo yoo ta'u; isinis gaaffilee kanaa gadiitiif deebii laatuun akka nu qarqaartaan isin gaafadha.Odeefannoo isin nuuf laattan tarkaanfiilee dhukkuba busaa too'achuuf fudhatamaniif oola.

Odeefannoo nuuf laattaan kamiyyuuicciitiin isaa ni eegama. Qo'annoo kanarratti hirmaatuu dhiisuun mirga keessan.

Maqaa gaafataa/qo'ataa: _____ guyyaa: _ _/_ _/_ _

Yeroo eegalame: _ _/_ _ Yeroo xumurame: _ _/_ _

II. Waliigaltee Qorataa

'Unkaa gaafii kana haaluma itti leenji'eef akeekachiisa isa keessatti ibsameen guutuu koo ragaan baya; Odeefannoon isa keessaa sirrii ta'uu mirkaneessee jira.'

Mallattaayaa _____ guyyaa _____

Guyyaa----------/ji'a ----------/bara ----------

Maqaa sassaabaa daatichaa ---------- mallattoo----------

Guyyaa qorannoo _ _/_ _/_ _

Maqaa too'ataa (suparvayzaraa) ---------- mallattoo ----------

Guyyaa**: _____**

Qorannoo kanarratti hirmaachuuf nieeyyamtaa?

Eeyyeen _____ lakki _____ Galatoomaa!

Dhiibbaa Sodaa Qorannoo HIV tiif Jecha Yeroon Yaala Barbaachuu Dhabuu Ijoollee Dhukkuba Busaa Qabaniif, Godina Shawa Bahaatti, Itiyoophiyaa.

No.	Identifikeeshiini	Deebii
1	Lakkoofsa Unkaa gaaffii	
2	Nannoo	
3	Godina	
4	Aanaa	
5	Ganda	
6	Maqaa buufata fayyaa	
7	Maqaa nama gaafatu	
8	Maqaa suparvayzaraa	
9	Guyyaa (dd/mm/yy)	/____/____/2005 EC

<u>Gaaffii Calallii (Haawwoliif/Yaalchistoota Daa'immaniitiif)</u>

Yeemmuu Busaa Qoratamuuf Yaalamuudhaaf gara Mana Yaalaa Dhuftan HIV illee nu Qoratu Jettanii Shakkittuu/yaadduu?

1. **Eeyyee**
2. **Lakkii**

Kutaa1. Odeeffannoo Waligalaa waa'ee hawaassummaa (dimogiraafi) warraa deebii laatuu

Lak.	Gaaffilee fi calaliiwwan	Gosoota deebiiwwanii	Irraa darbi
1	Iddoon jireenya keessan eessaa? (baadiyya/ magala)	Baadiyyaa 1 Magaala 2	
2	Saala nama gaafatamuu	Intala 1 Dhiira 2	
3	Umriin kee hoo meeqa?	/_____/ waggaa	
4	Hariiroon daa'ima dhukkubsatu wajjin qabdan maal?	Haadha 1 Abbaa 2 Obboleessa 3 Obboleetti 4 Kan biroo (ibsi)_____5	
5	Saalli itti gaafatamaa abbaa mana maal?	Dhiira 1 Intala 2	
6	Haallii fuudhaaf heerumaa kee yeroo ammaa maal?	Heerumeera/fuudheera 1 Hin heerumnne/hin fuune 2 walhiikneerra 3 narraa du'ee/duute 4 yeroodhaaf addaan bahu 5	
7	Amantaan kee maal?	Islaama 1 Ortodooksi 2 Katoolika 3 Pirotestaanti 4 Kan biroo (ibsi)_____5	
8	Sabni kee maal?	Oromoo 1 Amaara 2 Guraagee 3 Kambaata 4 Hadiyyaa 5 Tigree 6 Kan biroo(ibsi)_____7	
9	Sadarkaan guddaan barumsaa ykn golaa xumurtee kami?	Dubbisuuf barressuu hin danda'u 1 Dubbisuuf barressuu ni danda'a 2 saykilii 1ffaa (1-4) 3 saykilii 2ffaa (5-8) 4 sadarkaa 2ffaa (9-12) 5 TVET(10+1 ykn 10+2) 6 TVET(10 + 3 /Dipilooma) 7 Digrii Yuunivarsiity ykn isaa ol 8 Kan biroo (ibsi) _____9	
10	Yeroo ammaa caalmatti hojiin kee maal? • ***Deebii tokko qofa fili***	Qotee bulaa 1 Haadha manaa 2 Dalagaa humnaa 3 Hojjataa/ttuu mootummaa 4 Hojjataa/ttuu mit-mootummaa 5 Daldalaa 6 Barataa 7 Kan biroo(ibsi)_____8	

11	Manni jireenyaa keessan kanniin qabaaa: Elektiriika? Radiyoona tajajilu? Televisiyona tajaajilu? Telephone tajaajilu? Firiija tajaajilu? Biskileetii tajaajilu?	**EeyyeeLakki** ELEKTRIIKA .....1 2 RADIYOONA tajaajilu.....1 2 TELEVISIYONA tajaajil. 1 2 TELEPHONE tajaajilu 1 2 FIRIIJA tajaajilu..... 1 2 Biskileetti 1 2	
12	Meshaan caalmatti kurreen (baaxiin) manaa keessani irraa ijaaarame maal?	Citaa…… ……1 Qorqoorroo ……2 Kan biroo (ibsi)_____ 3	
13	Tajaajilli eegumsa fayyaa naannoo kessan dhiyoo jiru maal?	Keellaa fayyaa 1 Buufata fayyaa 2 Hospitaala mootummaa/dhuunfa 3 Kilinika dhuunfaa 4 Hin beeku 5 Kan biro(ibsi)_____ 6	
14	Buufanni fayyaa mana jireenyaa kessaan iraaa hangam fagaata?	Deemsa daqiiqa **30** gadi 1 Deemsa daqiiqa **30** – hanga saa'aa **1** gadi 2 Deemsa sa'aa**1**- sa'aa **2** gadi 3 Deemsa sa'aa **2**- sa'aa **3** gadii 4 Sa'aa **3** fi isaa ol 5 Hin beeku 6	
15	Mana keessan irraa hanga keellaa fayyaatti iddoo ummanni waliigalaan itti fayyadamu daqiiqaa meeqa deemsisa?	Deemsa daqiiqa **30** gadi 1 Deemsa daqiiqa **30** – hanga saa'aa **1** gadi 2 Deemsa sa'aa**1**- sa'aa **2** gadi 3 Deemsa sa'aa **2**- sa'aa **3** gadii 4 Sa'aa **3** fi isaa ol 5 Hin beeku 6	

Kutaa 2: Beekumsa waa'ee ittisaaf yaala dhukkuba busaa

Lakk.	Gaaffiilee fi calaltuuwwan	Gosoota deebiiwwanii	Irra darbi
16	Dhukkuba BUSAA akka rakko cimaa ummatatti ni lakkoftaa?	Eeyye 1 lakki 2	
17	Mallattooleen guguddoon BUSAA maal fa'a? • *Deebiin hedduun ni danda'ama, kan sirri irra mari* • *Deebii sirriitiif haalaan kakkasi(kan biros yoo jiraate)*	**Eeyye** **Miti** Hoo'a 1 2 Hollachuu 1 2 Dafquu 1 2 Bowwoo 1 2 Lolloojjii 1 2 Haqqee 1 2 Fedha nyaataa dhabuu 1 2 Afaan nama hadheessuu 1 2 Qaamni nama dadhabuu 1 2 Qamni hundi	

		nama dhukkubuu 1 2 Dheebuu 1 2 Baasaa 1 2 Hin beeku 1 2 Kan biroo(ibsi)_____	
18	Akka yaada keessaniitti busaa maaltu fidaa? • *Deebiin hedduun ni danda'ama, kan sirri irra mari* • *Deebii sirriitiif haalaan kakkasi(kan biros yoo jiraate)*	Iddiinsa bookee busaa 1 Shonkora hin bilchaanne nyaachuu 2 Hidda boqollaa nyaachuu 3 Beelaa(garacha duwwaa) 4 Qabbannaaf saaxilamuu ykn jijjiirama qileensa 5 Bishaan balfaa dhuguu 6 Tolcha/falfala 7 Saxilamiinsa iddoo balfamaa jiidha qabu 8 Hin beeku 9 Kan biro(ibsi) _____ 10	
19	Dhukkubni **BUSAA** kan caalatti hammaatu garee namoota kamiitti? • ***Deebiin hedduun ni danda'ama*** • ***Deebii sirriitiif haalaan kakaasi (Kan biros yoo jiraate?)***	Ga'eessota ……. 1 Daa'mman wagaa 5 gadii ……. 2 Ijoolleerratti ……. 3 Dubartii ulfaa……. 4 Jaarsolii ……. 5 Hundaafuu qixa hamaa dha……. 6 Hin beeku ykn ni mama……7	
20	Namni tokko akkamitti busaa ufi irraa ittisaa? • ***Deebiin hedduun ni danda'ama, kan sirri irra mari*** • ***Deebii sirritif sirritti kakaasi (Kan biros yoo jiraate?)***	Saaphana siree busa jala rafuu/ITNs……1 Iddiinsa bookee busaa hanbisu……2 Farra ilbiisotaa biifuu……3 Naannoo mana jireenyaatti bishaan ciisaa dhoorkuu 4 Naannawa manaa quliqulina eegu…..5 Naannawa manaatti aara aarsuu(baala/kosii) .6 Bishaan balfaa dhuguu dhiisuu…..7 Nyaata badaa nyaachuu dhabuu(shonkoora hin gahin/haftee) 8 Calaltuu busaa fooddaarra kaahu….9 Qullubbii adii nyaachuu….10 Alkoolii dhuguu…11 Kan biro(ibsi)_____12 Hin bekuu 13	
21	Dhukkubni busaa dhibee ittisuun danda'amuu dha?	Eeyee 1 Lakki 2 Hin beeku ykn mamii qaba 3	

22	Dhukkubni busaa dhibee yaaluun/fayyuun danda'amuu dhaa?	Eeyee 1 Lakki 2 Hin beeku ykn mamii qaba 3	
23	Dhukkubni BUSAA nama tokko irraa kan birootti kan darbuun hiddiinsa bookee busaa dhibeen qabamteen	Dhugaa 1 Soba 2 Hin beeku ykn shakkii qaba 3	
24	Dhukkuba Busaa tiif hatattamaan yaala barbaachuun bu'aa qabaa	Dhugaa 1 Soba 2	
25	Namni tokko akkuma itti fooyya'een dawaa dhukkuba busaa fudhachuu dhiisuu ni danda'a	Dhugaa 1 Soba 2	
26	Keemikaalli mana keessatti biifamu busaa ittisudhaaf mala bu'a qabeessa	Dhugaa 1 Soba 2	
27	Saaphana siree bookee busaa/ITN jala rafuun busaa ittisudhaaf mala bu'a qabeessa	Dhugaa 1 Soba 2	
28	Manni jireenyaa keessan yeroo ammaa kana saaphana siree bookee busaa/ITN yeroo rafan fayyadaman qabaa?	Eeyyee 1 lakki 2	→ **34**
29	Saaphana siree bookee busaa meeqa manaa qabduu(kan fayyadamee fi hinfadamin illee)	/_____/	
30	Torbee lamaan darban keessatti saaphana siree bookee busaa jala hangam bultan?	Halkan hundaa 1 Guutumatti halkan hundaa 2 Darbee darbee 3 Hankan xiqoo qofa 4 Homaayyuu jala hin bulle 5	
31	Halkan edaa saaphana siree bookee busaa jala bultanii?	Eeyyee 1 lakki 2	
32	Torbee lamaan darban (gayya 15) keessatti saaphana siree bookee busaa jala daa'imni dhukkubsate guyyaa hangam bule?	Halkan hundaa 1 Guutumatti halkan hundaa 2 Darbee darbee 3 Hankan xiqoo qofa 4 Homaayyuu jala hin bulle 5	
33	Halkan edaa daa'imni dhukkubsate saaphana siree bookee busaa jala bulee?	Eeyyee 1 Lakki 2	

Kutaa 3: Beekumsa waa'ee ittisaa fi qorannoo HIV/AIDS

An amma carraa vayrasii HIVtiin qabamu keessan irratti gaaffileen xinnoo isin gaafadha

Lakk	Gaaffilee fi calalliiwan	Gosoota deebiiwwanii	Irra darbi
34	Iddiinsa bookee busaatirraa namni tokko HIVn qabamuu ni danda'a	Dhugaa 1 Soba 2 Hin beeku ykn mamii qaba 3	
35	Namni fayya qabeessa fakkatu HIV qabaachu ni danda'aa?	Dhugaa 1 Soba 2 Hin beeku ykn mamii qaba 3	
36	Karaan dhukkuba HIVtiin qabamuu ufirraa ittisaniin tokko walqunnamtii saalaa irraa fagaachuudha	Dhugaa 1 Soba 2 Hin beeku ykn mamii qaba 3	

37	HIVn haadha irraa gara daa'imaa darbuu ni danda'a	Dhugaa 1 Soba 2 Hin beeku ykn mamiii qaba 3	
38	Qorannoon namni tokko HIV, vayrasi AIDS fidu, qabaachuu fi dhabuu isaa/ishee baruuf taasisu ni jira	Dhugaa 1 Soba 2 Hin beeku ykn mamii qaba 3	**→40** **→40**
39	HIV qabaachu isaa/ishee baruuf Iddoon namni tokko qorannoo icciitii itti argachuu danda'u eessa? • **Kan sirrii ta'u hundaa irra mari**	Buufata fayyaa mootummaa 1 Hospitaala mootummaa 2 Hospitaala dhuunfaa 3 Kilinika dhuunfaa 4 Yuunitii VCT sosso'aa 5 Hin beeku ykn mamii qaba 6 Kan biro(ibsi) _____7	
40	Ji'oota 12n darban kamiin keessattu, daai'ma dhibameef mana yaalaa dhaqxee beektaa?	Eeyyee 1 Lakki 2	**→44**
41	Gaaffii 40 deebiin kee eeyyee yoo ta'e, qoranno dhiigaa HIV tiif ogeessota fayyaatiin gaafatamtee beektaa?	Eeyyee 1 Lakki 2	**→44**
42	Yoo gaaffii 41 fi eeyyee jette, qorannoo HIV tiif dhiiga kennitee?	Eeyyee 1 Lakki 2	**→44**
43	Maaloo natti hin himiniitii, garuu bu'aa qorannoo keetii argitee?	Eeyyee 1 Lakki 2	
44	Hawaasa keessaatti nama kamiifuu qorannoo dhiigaa HIV ogeessota fayyaatiin mana yaalaatti ajajamuu isaa dhagesse jirtaa?	Eeyyee 1 Lakki 2	
45	Akka yaadaa keessaniitti, ajajajiinsa qorannoo dhiigaa HIV dhibamaaf ogeessota fayyaatiin godhamu ni fudhattu moo ni dhiistu?	Nan fudhadha 1 Hin fudhadhu 2 Hin beeku ykn mamii qaba 3	

Kutaa 4: Sodaa/yaaddahuu wa'ee qoratamiinsa HIV tiif jecha duubatti harkifachuu qorannoo fi yaala busaa

Lakk.	**Gaaffilee fi calaltuuwwan**	**Garee deebiiwwanii**	**Irra darbi**
46	Busaa qabaachuuf dhiisuu isaa (ykn ishee) baruuf qorannoon namni tokko raawwatu jiraa?	Eeyyee 1 Lakki 2 Hin beeku /mamii qaba 3	
47	Qorannoon dhiigaa kan BUSAA fi HIV walfakkaataa?	Eeyyee 1 Lakki 2 Hin beeku / mamii qaba 3	
48	Akka ilaalcha keessaniitti qorannoon HIV nama busaa laallamuuf dhiiga kenne hundaafu mana yaalaa keessatti ni hojjatamaa?	Eeyyee 1 Lakki 2 Hin beeku / mamii qaba 3	

49	Dhiiga busaa laallamuuf laatte iraa qorannoon HIV sirratti/daa'ima keerratti raawatamuu isaa hangam itti amantaa?	Guutumatti itti hin amanu 1 bicuu isheen amana 2 Hanga tokko ni amana 3 Baay'ee itti amana 4 Guutumatti itti amana 5 Hin beeku / mamii qaba 6	
50	Ummata keessatti namoota hangamtu dhiigni busaa qoratuuf fudhatamu HIV illee qorachuuf tajaajila jedheet amanaa?	Homaa 1 Xinnoo 2 Baay'ee 3 Irraa caalaan 4 Hundinuu 5 Hin beeku / mamii qaba 6	
51	Ummata keessatti namootni soda qorannoo dhiigaa HIV tiif jechaa busaa yaalamuuf gara mana yaalaa dhufuu dhiisan dhageessee jirtaa?	Eeyyee 1 Lakki 2 Hin beeku / mamii qaba 3	
52	Sodaan qorannoo HIV mana yaalaa keessaa, duubatti harkifachuu yeroon qoratamuu fi yaalamuu dhibee busaatiif sababa ta'a jettanii ni yaadduu?	Eeyyee 1 Lakki 2 Hin beeku 3	

Kutaa 5: **Haala Barbacha Yaala Ijoolle Dhukkuba ammaa Kanaaf**

53	Saalli daa'ima dhibamuu maal?	dhiira1 dubara2	
54	Umriin daa'ima dhibamuu waggaa guutuun meeqa?	/_____/ waggoota	
55	Dhibeen kun hanga jalqabee guyyaa meeqa? • ***Yoo guyyaa 1 gadi ta'ee, "00" guuti.***	Guyyoota darban……. Hin beeku…..……98	
56	Akka ilaalcha keessaniitti dhukkuba amma daa'ima kee qabee maaltu fida jettee yaadda? • ***Deebii tokko qofa***	Busaa 1 HIV/AIDS 2 Kan biroo(ibsi)_____3	
57	Otoo gara mana yaalaa kana hin dhufne dura daa'ima dhibamu kanaaf iddoo biraa irraa gorsa ykn yaala barbaaddanii turtanii?	Eeyyee 1 Lakki 2	→ **60**
58	Yoo deebiin gaaffii 57 eeyyee ta'e, daa'ima keessanif iddoo kamitti gorsa ykn yaala barbaaddan? • ***Iddoo kamiyyuu iddoo ibsamee hundaa barreessi***	Kellaa fayyaa 1 Buufata fayyaa 2 Kilinika dhuunfaa 3 Faarmaasii/duunkaana qorichaa 4 Hospitaala mootummaa/dhuunfaa 5 Kan biroo (ibsi) _____6	
59	Ergaa dhukkubni kun daa'ima keessan eegale guyyaa meeqa booda yeroo duraatiif gorsaa ykn yaala barbaaddan? ***Yoo guyyaa tokko gadi ta'ee, "00" guuti***.	Guyyaa_____	
60	Yeroo dhukkubsate kamittuu, daa'imnni **qorcha woyii** fudhatee beekaa?	Eeyyee 1 Lakki 2 Hin beeku /shakki qaba 3	 **→63** **→63**
61	Yeroo dhukkubsate kamittuu, daa'iminni ***qorcha dhukkuba busaa*** fudhatee beeka?	Eeyyee 1 Lakki 2 Hin beeku /shakki qaba 3	 **→63** **→63**

62	Deebii G61 eeyyee yoo ta'e, Qoricha busa isa kam da'ima dhibamuuf laattan?	CoArtem 1 Chloroquine 2 Quinine 3 Fansidar 4 Hin beeku 5 Kan biro(ibsi) _____ 6	
63	Dhimmii cimaan daa'ima dhibamu gara mana yaala kana fiddaniif maal?	Haalli itti cimaa dhufuusaa 1 Ogeessa fayyaa biraatiin ergameeti 2 Busaa dhiiga qoratamuuf 3 Kan biro(ibsi) _____4	
64	Ergaa dhibeen kun daa'ima keessan eegale guyyaa meeqa booda gara mana yaala kana dhuftan? ***Yoo guyyaaa tokko gadi ta'ee, "00" guuti.***	Guyyoota_____	
65	Yoo deebiin gaaffii 64 ffaa guyya **1** ol ta'e, dhimmi cimaan akka turamu taasise maal?	Hanqina qarshii 1 Soda qorannoo HIV 2 Dhibeen hamaa ta'uu dhiisuu 3 Mannii yaalaa dhihotti dhabamu 4 Yeroo hedduun xinnoo turanii ilaaluu 5 Kan biro(ibsi)_____ 6	

Kutaa 6: Bu'aa laboraatoorii daa'ima dhibamuuf qabuuf

Lakk.	Gaaffilee fi calaltuuwwaan	Gosa deebiiwwanii	Irra darbi
66	Fiilmiin dhiigaa (blood film) maxxantuu busaa qoratuuf daa'ima dhibamu irraa fudhatamee.	Eeyyee 1 Lakki 2	→70
67	Qorannoon dhiigaa daa'imaa dhibamuuf diagnostic teestii maal fayyadamun taasifamer?	Maaykiroskopii 1 RDT 2	
68	Bu'aan laboratoorii daa'imaa dhibamuu maal?	Posatiiva 1 Negatiiva 2	→70
69	Sanyiin pilaasmoodiyeem dhukkuba fidee kami?	P. falsiiparum 1 P. vivax 2 Makaa lamaanii 3 Kan biroo (ibsi)_____4	
70	Daa'imichaaf dawaan kamiyyuu ogeessota fayyaatiin mana yaalatti ajajamuu qaba turee?	Eeyyee 1 Lakki 2	→ STOP
71	Daa'imichaa dhibamuuf dawaan FARRA BUSAA kamiyyuu ajajamuu qaba turee?	Eeyyee 1 Lakki 2 Hin beeku /shakki qaba 3	→ STOP → STOP

72	Qorichi FARRA BUSAA daa'imichaaf ajajame isa kami? • ***deebii hundaa galmeessi***	CoArtemii 1 Kilorooqinii/Chloroquine 2 Quinini 3 Fansidar 4 Hin beeku 9 Kan biroo (ibsi) _____ 10	

Kun xumura gaaffii keenyaati.Yeeroo fudhattanii deebii nuu laattanif baay'ee galatoomaa!

	Name	Signature	Date
Data collector	_____	_____	_____
Supervisor	_____	_____	_____

QUALITATIVE PART

3: In-depth Interview guide and concent form for health personnel

Consent Form

Hello my name is _____. I work for an organization named Addis Ababa University School of Public Health. I'm here to collect information for the research conducted on malaria treatment delay due to concern n HIV testing. Thus we would like to hear your opinion on community's health seeking behavior and concern of HIV testing on delaying early health seeking for children.

Participation is based on your willingness besides; you can withdraw from the study anytime.

However your kin participation would mean a lot. In addition, no personal identification will be written and we assure you that whatever information you are providing will only be used for the research purpose and the data will be handled only by the research team.

While we are collecting the data, it is difficult to jot down everything thus we will tape record our discussion.

Are you willing to participate in the study?

Agreed _____

Not Agreed _____

Thank you

Name Data collector _____ signature _____

Date of data collection _____

In- Depth Interview for Malaria Focal Person

Age_____ sex _____

Occupation _____

Objective: To explore barriers to early treatment seeking behavior and concern of HIV test of children comingfor treatment of malaria.

1. Do communities in your area have awareness about malaria prevention and treatment? How?
2. What community knowledge about HIV testing and preventions look like?
3. What do you say about community's perception on HIV testing?
4. What do you say about early treatment seeking behavior of community in this health center?
5. Factors associated with delaying. How long it takes a person to seek for medical care after having malaria symptoms. If there is a delay, why delay?
6. What did you observe from the community coming for malaria treatment up on request for HIV test - experience, expectations, patient-staff relation?

THANK YOU VERY MUCH!!!

4: Question-Guide and concent form ofFGDs on malaria

The moderator should make the effort to interact with the participants briefly outside of the discussion room before the focus group discussion takes place.

I. INTRODUCTION

Good morning/afternoon and thank you all for coming. My name is _____ and this is my colleague _____. We are working with A.A.U, SPH, and DCH, ------- We are conducting several meetings with people like you to find out how you feel about several health issues. We will be talking to groups of men and women. Your opinions are very important, and will help us improve the kind of services that are provided. Please tell us your feelings and ideas about the topics that come up in today's talk.

There is no right or wrong answers, and you do not have to agree with what someone else says. Everyone's contribution is valuable. We want this to be a group discussion; so don't wait for me to call on you. Just speak up. Speak up one at a time so we all can hear.

Your answers will remain confidential and anonymous. Your answers will help us plan programs for your area.

So that we do not lose any important information, we would like to tape-record the discussion. Is that all right with everyone? You may listen to the discussion at the end if you wish.

Note to the moderator: Moderators should pay attention to the mood of the group, and ask questions about respondents' personal opinions and practices as much as possible with phrases like “How about you?"

II. ICE-BREAKER EXERCISE

Conduct round-table introductions. Request each participant to take a few minutes to talk with the person on his left. He should find out all they can about that person--where he lives, how he spends his time in the village and what his interests are. Give participants 2 or 3 minutes to talk with their neighbors. Then ask each participant to introduce his neighbor to the group

Are you willing to participate in the study?

Agreed _____

Not Agreed _____

FGD: Socio-demographic status of the mothers/caretakers

Participants No	Age	Marital status	Religion	Occupation	Education	Grade

QUESTIONS

A. Knowledge about malaria prevention and treatment

a) Discuss: cause of malaria Prompt: dirty water

b) Explain symptoms make you think that the child may have malaria

c) Discuss on time to seek treatment for the child with malaria; what do you usually do?

d) What do you plan to do against malaria/ how can we prevent malaria**?**

B. Concern about malaria and HIV blood testing and prevention

1) Discuss: how does a malaria blood test is done?
2) Discuss and describe: how does HIV blood test is done?
3) Discuss differences and similarities b/n HIV and malaria blood test
4) Do you think that blood drawn for malaria test will also be used for HIV test during malaria diagnosis?How?
5) Describe how community feel about concern of HIV blood test in health facilities up on blood aken for malaria test
6) Do you think that fear of HIV testing at health facilities could be the reason for the delay of malaria treatment seeking? Why?

THANK YOU VERY MUCH!!!

In-depth Interview Guide for community (AFAAN OROMO VERSION)

Unkaa gaaffilee soda qorannoo HIV tiif jecha yeroon yaala barbaachuu dhabuu ijoollee dhukkuba busaatiif, godina shawa bahaatti, Ethiopia

Gadii Fageenyaan Qorachuu: In-depth Interview Guide for malaria focal person (Afan Oromo Version)

Akkam jirtaa?. Maqaan Kiyyaa_____jedhama. Finfinnee keessatti dhaabbata 'YuunivarsiitiiFinfinnee' Egumsa Fayyaa Hawaasummaa irratti hojjatu keessa hojjadha.

Iddoo kana wanti dhufeef qo'annoo **duubatti harkifatiinsa yaala dhukkuba busaa shakkii ykn soda qorannoo HIV tiif jechaa** gaggeefamu irrat odeefannoo sassaabuuf dha.Kanaafu nuti amma yaadaa isin dhimmaa kanaratti qabdan dhaggeefachuuf

Qo'annaa kanatti kan hirmaattan fedhiidhaan. Yeroo dhimmi addaa nama mudate addaan

kutanii bahuun homa jiru. Garuu, hirmaannaan keessan qo'annaa adeemsifamuuf milkaa' inna

ol'annaa akka qabu ibsuun barbaada. Odeeffannoon isin nuuf kennitan kaayyoo qo'annoo asiin

olitti ibsameen alatti kan birootiif akka hin oolle maqaa dhaabbatichaatiin waadaa isiniif seenaa,

dhimma waa'ee nama tokkoo ifatti ibsuun ragaa hin galmeessinu.

Dhuma irratti odeeffannoo funaanamu kana hundaa haala barreeffamaatiin galmeeffachuun waan ulfaatuuf marii amma adeemsifnu teephiidhaan waraabbana.

Egaa qo'annoo adeemsifamu kanatti hirmachuuf feedhii qabdan maaliin nuuf ibsitu_____.

Eeyyeen/lakki.

Gala toomaa!

Maqaa nama odeefannoo sassaabuu _____ mallattoo _____

Guyyaa odeefannoon sassaabame_____

UNKAA GAAFFILEE (**QUESTIONNAIRE) AFAAN OROMOOTIIN**

Kutaa kuwalitatiiva (Qualitative Part)

Kaayyoo:funaaniisa ragaalee dhimmaa haala yeroodhaan yaala barbaachuuf shakkii dhiiga qoratiinsa dhibee HIV ijoollee dhukkuba busaa yaalamuuf dhufan irraatti.

1. Hawaasni naannoo waa'ee busaarratti qayyabannaa qabaa?Akkamitti?
2. Hawaasni naannoo ittisaaf qorannoo HIV irratti beekumsi qabu maal fakkaata?
3. Ilaalchi hawasni naanichaa qorannoo dhiigaa HIV irratti qabu maal fakkaata?
4. Yeroodhaan yaala barbaacha hawaasaa buufata fayyaa kanatti maal fakkaata, akkamitti ilaaltaa?
5. Wantoonnii duubattii harkifachuu yaalaatiif sababa ta'an maal fa'a?yeroo hangam isaanitti fudhata? Ni barfataa?Maaf sitti fakkaata?
6. Hawaasa busaa yaalamuf dhufee qorannoon dhiiga HIV ajajameef irratti maal qayyabattan?

Baay'ee isin galateefanna!

Akeektuu-Gaaffilee: FGD Guide for Community (Afan Oromo)

Dursee gola mariitin duratti namni marii gaggeessaan hirmaattota wajjiin hariiroo uumuuf carraaqii godhuu isa barbaachisa.

I. Seensa

Nagaa bultanii/barfattanii, dhufuu keessaniif galatoomaa.Maqaan koo _____ inni kun miiltoo kooti _____. Nuti Yunivarsiiti A.A,SPH, and DCH wajjiin yemmuu hojjanu; ------- namoota akka keessanii wajjiinwalgahii hedduun gageessaa jira kunis ilaalcha keessan qorannoo dhibee busaa fi HIV irratti ilaaluu barbaanna.Garee dhiiraaf dubartootaa wajjiinis haasayaa turreerra.Yaadni keessaan baay'ee nu barbaachisa, akkasumas fooyya'iinsa tajaajila kennaamuutiifis ni fayyada. Maaloo mataduree ibsame irratti waan isinitti dhagayameef waan yaaddaannuuf himaa.

Deebiin sirrii ykn dogongoraa hin jiraatu, akasumas wanta namni biraa jedhee fudhatuuf dirqama hin qabdan.Yaanni nama kamiituu barbaachisaadha.

Nuti kana marii garee akka ta'u barbaanna; kanaafu hanga maqaa keessan waamuu nuhin eeginaa. Amma dubadhaa.Akkaa hundi keenyaa dhageennutti dubadhaa.

Deebii kessaan icciitiin ni eegama, maqaas hin qabaatu. Deebiin keessan karooraaf nu fayyada.

Kanaafuu odeefannoobu'a qabeessa kamiyyu dhabuu hin barbaannu, marii kana teepppiin woraabattuu barbaanna. Kun nama hundaafuu ifaa? Dhumarratti namni barbaade marii keenya kana dhageefatuu danda'a.

Yaadannoo marii-gaggeessaaf: mari-gaggeesonni muudii warraa deebisuutiif xiyyeefannoo kennuudhaan akkasumas gaaffii yaada dhuunfaa fi muxannoo isaanii hanga danda'ameen gaafachuun; gaalee akka "ati hoo?"

III. Carraqqii karaa banu(ICE-BREAKER EXERCISE)

Seensa marsaa- teessoo raawwadhu.Tokko tokkoon hirmaataa daqiiqa muraasaaf akkaa nama bitaa isaatiin jiru wajjiin haasayu ajaji. Namuu waa'ee nama kana hamma danda'ee akka beeku taasisa --- eessa akka jiraatu, ganda keessatti yeroo isaa akkamitti akka dabarsee fi fedhiin isaa akka fakaatu.

Hirmatotaaf akkaolla isaanii wajjiin haasayan daqiiqaa 2 ykn 3 kenniif. Kanaan boodaa hirmattota mataa mataan akka nama isaanitti anuu walbarsiisan gaafadhu.

Egaa qo'annoo adeemsifamu kanatti hirmachuuf feedhii qabdan maaliin nuuf ibsitu_____.

Eeyyeen/lakki._____

Gaaffilee:

A. Beekumsa waa'ee ittisaaf yaala dhukkuba busaa

a) Busaan maal irraa dhufa?Namoota kakaasi: fkn.Bishaan balfaa…
b) Mallattooleen daa'imni keessan akkaa dhukkuba busaa qabu isinii ibsuu maal fa'a?
c) Yemmuu daa'imni keessan dhukkuba busaa qabaatu, guyyaa ykn saa'aa meeqa booda yaala barbaadaniif?
d) Karoorri busaa yaaluuf ykn ittisuuf gootan jiraa; akkamitti ittistan.

B. Sodaa qorannoof ittisa HIV, busaa qoratamuurraa turuu

1. Marii taasisaa: Qorannoon busaa laboraatooriin akkamitti dalagama?
2. Marii taasisaa: Qorannoon HIV laboraatooriin akkamitti dalagama?
3. Marii taasisaa: Wal-fakkeennaf garagarummaan qorannoo dhiigaa giduu BUSAA fi HIV jiraa, ibsi?
4. Marii taasisaa: Dhiigni dhukuba busaa qorachuuf fudhatame dhibee HIV illee qorachuufni tajaajila jettanii yaadduu? Akkamitti?
5. Ummata keessatti waa'een qorannoon dhiigaa dhukkuba busaaf sodaan HIV maal fakkaata?
6. Yaanni keessan qorannoon dhiigaa busaa fi HIV irraatti maal fakkata?Dhiigni busaa qoratuuf fudhatamu HIV qorachuufis ni oolaa?

Baay'ee isin galateefanna!

Declaration

1. Declaration of the principal investigator

I the undersigned, senior MPH student declare that this thesis is my original work in partial fulfillment of the requirements for the degree of master of public health. All the sources of the materials used for this thesis and all people and institutions who gave support for this work are fully acknowledged.

Name- **Yusuf Haji, BSc.**

Signature_____

Place of submission – School of Public Health, College of Health Sciences,

Addis Ababa University

Date of submission: _____

2. Approval of the primary advisor

This thesis work has been submitted for examination with my approval as university advisor.

Advisor's name –**Wakgari Daressa (PhD, Associate professor)**

Signature_____