

Factors affecting the insecticide treated bed nets use of under-five children and pregnant womane among households in Shashogo Woreda, Hadiya zone, South Ethiopia.

By: Mengistu Handiso (Bsc)

Thesis submitted to the college of Public health and Medical sciences school of graduate study, department of Epidemiology, in partial fulfillment of the requirements for the Degree of Masters in Epidemiology (MPHE).

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Jimma, June 2011

Abstract

Background: Malaria had been a major problem for Sub Saharan Africa and Ethiopia for long. Recognizing the problem the Roll back malaria initiative is aiming to decrease the disease burden and working since 1998. Due to mass killing effect of ITN on vector it prevents the community and the benefit may also extend to non user. Considering this measures, ITNs are being distributed widely. But many field issues pertaining to their use are not answered in the Ethiopian situation. The objective of the study is to determine factors affecting the utilization of ITN in under five children and pregnant women in Shashogo Woreda, where the nets were distributed for free.

Methods and materials: A cross sectional study was conducted by using both qualitative and quantitative approaches. The source populations were all households in Urban and Rural areas of Shashogo Woreda. Study subjects were pregnant women and under-five children within selected households. The total sample sizes were 806, which was selected by multistage sampling technique. The data collectors interviewed the head of household or their spouse in the absence of head using structured questionnaire and filled the check list by inspecting the bed net. This is triangulated by focus group discussion among dwellers of the Woreda and in depth interview among important stake holders.

Results and discussion: The Coverage of ITN was 98.4%. Proportions of ITN use for pregnant woman and under- fives were 86.6%, 45.0%, respectively. From proportion of 21.5% household that had pregnant woman and under-five children, 54.3% had net, 78.7% used the available net, 47.3% slept under ITN the previous night. The proportions of proper ITN utilization for pregnant woman and under-five the previous night were 56.8% and 44.7% respectively. This is supported by qualitative study they used their nets for other purposes, due to the reason of inadequate traing, and housing condition and though LLTN serves long time, it was not ready to use. Access to health information were associated with increase the odds of ITN utilization the previous night for both pregnant woman and under-five. But as age of respondents increased, the odds of utilization of ITN decreased for pregnant woman.

Concolusion and recommendation: The coverage of ITN and proportion of proper ITN utilization in the study area was higher compared to the results of studies conducted previously in different parts of the country. But there were a wide gap between possession and proper utilization for high risk group. Awareness of ITN, belief ITN not to cause any problem, access of health information and age of respondent were independent predictors. FMOH should develop appropriate IEC/BCC intervention and promotion activities to narrow the gap between ITN coverage and utilization of pregnant woman and under-five.

Key words: coverage, mosquito net, ITN, LLTNs

Acknowledgements

I would like to thank the Jimma University School of graduate studies for providing me this golden opportunity to carry out the research task as part of the requirement of master in public health.

I would thank my advisors for their unreserved guidance, timely relevant and constrictive comments throughout the preparing proposal.

I would also like to acknowledge Hossana College of health sciences for its material support and Providing me all the necessary facilities needed during the study period.

Last but not the least, my acknowledgement goes to Hadiya zone health department, Shashogo Woreda health department, kebele administrators, study participants and data Collectors for their valuable contribution in the realization of this study.

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Acronyms and abbreviation

BCC	behavioral change communication
DDT	dichlorodiphenyltrichloroethane
FGD	focus group discussion
IEC	information education communication
ITNs	insecticide treated nets
KAP	knowledge attitude practice
LLIN	long lasting insecticide net
NGO	none governmental organization
PSU	primary sampling unit
RHEW	rural health extension worker
SSU	secondary sampling unit
SRS	simple random sampling
SNNPR	south nation nationality people region
UHEW	urban health extension worker
UNDP	unit nation development program
UNICEF	unit nation children's Funds
WHO	world health organization
FMOH	Federal Ministry of Health

1. Introduction

1.1 Background

Each year, malaria, a parasitic disease spread by mosquito bite, results in 300 to 500 million clinical cases globally of which 90% occur in Sub Saharan Africa(1). Mostly it is under five children in Sub Saharan Africa who are affected, dying at a rate of nearly 3000 per day; contributing to 20% of the all child deaths(1).

Coming to the Ethiopian situation, in a non epidemic year, 5-6 million clinical cases and over 600,000 confirmed cases are reported from health facilities(2). Malaria has been reported as the major cause of morbidity and mortality, accounting for 15.5% of outpatient consultations, 20.4%of admissions and 27% of inpatient deaths(3). In southern Nation and nationalities and people region (SNNPR), about 65% of population living in malaria endemic area (4)

From the 20% of all child death in sub-Sahara Africa, Some suffer from the acute lethal complications; others succumb to the severe anemia or consequences of low birth weight. Among survivors malaria hinders optimal growth and development(1).During pregnancy malaria poses substantial risk to the mother, fetus and the neonate as it can lead to severe clinical illness, anemia and low birth weight(3). Beyond the individual ailments, the disease results in increased burden to health institutions, poor pregnancy outcome, poor growth of economy and others (1). It also causes significant impediment to economic development. It costs the region between \$3-12billion and inhibiting economic growth by as much as 1.3% each year(5).Ten percent of the continents disease burden is due to malaria(6). It accounts for about 40% of public health expenditures, up to 50% of inpatient admissions and outpatient visits in areas of high transmission(1).

About three-quarters of the total area of Ethiopia is malarias with an estimated 48million (68%) of the population being at risk (2).Generally, highlands or highland fringe areas between 1000 and 2000 meters of altitude can be considered as highly epidemic prone; however, as a result of ecological degradation and increase in temperature, malaria transmission has also been detected at altitudes as high as 2300m (3). Only few areas in the western lowlands of the country have relatively stable transmission (3). The other

areas have unstable transmission i.e. are epidemic prone. Unlike stable transmission the unstable one renders no or little protective immunity against malaria (7). Large scale trials of ITNs conducted over two years period in various epidemiologic settings across Africa reported a 15-33% reduction in all cause of child mortality (10). Properly used ITNs can cut malaria transmission by at least 50 % (1, 5). During pregnancy ITN use provides significant protection against maternal anemia and low birth weight, major contributors of neonatal morbidity (1).

All the mentioned benefits of ITNs can be obtained through proper practice (11). Households are supposed to hang the nets and sleep under them even during seasons when their use is uncomfortably hot and there may not be enough biting by nuisance insects to make net use seem worthwhile (12). Users should tuck them in under the mattress before sleeping, follow treatment schedules when possible, mend any holes, and give priority to children and pregnant women (12, 13). Community members must also make sure that people, especially children, go to bed before vectors start biting and do not get up before they stop (14). Therefore, better understanding of people's perception of malaria and its perceived cause, preventive action and values attached to ITNs are needed for planning mosquito net program (9).

1.2 Statement of the problem

Recognizing the malaria problem, the Roll back malaria initiative is aiming to decrease the disease burden and working since 1998 by the WHO, UNDP, UNICEF and the World Bank to enhance global support, mobilize resources and build partnership to half the malaria burden by 2010 (1). Among the preventive measure Insecticide Treated Nets (ITNs) provides physical barriers and with treatment generate a chemical that extends beyond the mosquitoes itself (8). Protection within a community may also extend to non-users due to the mass killing effects of ITNs on vectors (9).

Study on ITN use in Latin America stated that, use of nets was higher for infants and young children than for other children and adults (14, 15). But, this does not appear to be the situation in Africa, where traditionally, adults by virtue of their age and position as family income earners get priority coverage (16, 17, 18, 19, 20). There has been limited use of mosquito nets in Ethiopia historically. Implementation of ITN use for malaria prevention is still at an early stage. Strong seasonal transmission of malaria renders malaria much more sensitive to anti-vector measures such as the use of ITNs(3,11). Accordingly, among the targets for 2005 of the Abuja Malaria Summit is that at least 60% of those at risk of malaria, especially young children and pregnant women, should benefit from the best use of ITNs(5). Although there are prospects to such a goal, like the global fund, what had been achieved in years was disappointing (8, 7, 6, 1). Fewer than 5% of children in sub Saharan Africa were sleeping under ITNs and only about 20% are sleeping under any kind of nets by 2002(1). A data reviewed by WHO from a series of nationally representative surveys from 29 countries (conducted between 1991 and 2001) gave an overall average of 2% for under five children sleeping under ITNs (21).

ITN distribution has been massively expanded since 2005, but there is little information on use of nets owned and reasons for non-use, either in Ethiopia or other countries. Most studies of ITN use attempt to explain why vulnerable groups are or are not under an ITN, or describe which household members use the household's ITN(s), but there was no common conclusion (13, 22, 23). In many parts of Africa, the proportion of children under five years of age who slept under a net during the night preceding the survey was considerably lower than the proportion of households that possess a net (13).

In Ethiopia the distribution of ITNs through the health care delivery system was first introduced in 1997. Following a number of small scale distributions, in 2000-2003 UNICEF donated a total of 1.42 million ITNs and the distribution continued thereafter (3). However, only 6% of children sleep under ITNs the prior night in 2004 and its coverage was about 24% households with at least one ITN in 2005(43). The national strategic plan for ITNs aims to scale up use and coverage by target districts to 60% by the end of 2007(7). Major constraints mentioned were low awareness, poor institutional capacity and low income of the population to buy nets. The target for the next five years (2006-2010) is to achieve 100% coverage of all household in malarial areas with at least one ITN by 2007 (3, 7). In a KAP study carried out in Tigray it was found that 70% knew that mosquito net use could prevent malaria and 100% believed that mosquito nets would be used if available(24). In this study, affordability and willingness to buy mosquito nets were appraised. Accordingly, 17/100 stated that the government should provide nets for free. When asked about affordability, the mean amount a family could spend for one mosquito net was 13(+/-9) Ethiopian Birr. 14/100 respondents said that they could pay nothing (24). Rural community study in Butajira showed that, only 13% mentioned mosquito net use as a preventive measure (25). In a study conducted in Arbaminch in 2009, both coverage and utilization were higher in rural areas than in urban areas. The proportion of pregnant women and children under five years who slept under ITNs the night preceding the study was 35% and 40.3%, respectively. Education and income of head of households, place of residence of households and presence of high risk groups in the household were found to be predictors of net possession (38).

Indeed, the activities pertaining to the distribution of ITNs many questions remain unanswered. The extent to which people are aware and acquire nets is not understood clearly. Observation and rumors of not hanging nets at all, hanging nets in a wrong manner and place and not giving priority to children and pregnant mothers deserve close examination. The perception of the population on the role of ITNs in the prevention of malaria is still another issue. In my study area in 2009, 43066 household LLTNs were distributed in high risk transmission season, 4025 cases of malaria were reported. (2010 annual zonal report), but they didn't know the factors that affect utilization of ITN, the proportion of households that reported owning a net, regular treatment with insecticides and demand in the area are not identified. Even, no further study was conducted. Therefore this study explored as to why ITN is not used in the study community.

2. Literature review

Nets have been in use since very early times to protect people against different insects, including mosquitoes (9). They can have rectangular, circular wedge or other shapes and are produced in different colors (9). Nets are preferably treated with insecticides if not possible, they can be used untreated. Insecticide treated ones either kill or irritate the mosquitoes beyond being physical barriers (9). They serve as human baited traps when somebody is sleeping inside by attracting and killing mosquitoes and other biting insects (12). Insecticide-treated nets (ITNs) that need to be retreated with insecticide at home or in the community (once or twice a year or after every three washes) were in common use. The commonest chemicals used are second and third generation synthetic pyrethroids (9, 26). LLINs are treated with an insecticide that is effective for three to five years or twenty washes. These nets are more durable and more effective than traditional bed nets because they are made of plastic (blended with 2% permethrin to kill mosquitoes) rather than the weaker polyester fiber of traditional nets. In addition, washing and drying the nets does not decrease the effectiveness of the LLINs. Indeed this process actually reactivates the chemical release mechanism of the nets (27)

2.1 Efficacy of ITNs in reducing to malaria

It was found that 10.5% of bites were not prevented and those were mostly before dawn. Potential exposure occurs when people leave the bed to check on noise or urinate. People might not tuck in the net properly when returning (30).

2.2 Role of treated nets

The practical scenario in different parts Africa is that after mosquito net trials, when the responsibility of retreating is left for individual households, retreatment rates rapidly fall (26, 31). Nets without insecticide treatment are said to have limited use because insects use small holes to enter, easily attack a neighboring unprotected individual or persist until the individual comes out(9,26). A trial in Kenya concluded that efficacy of nets is reduced if retreatment with permethrin is delayed beyond six months (28). But other studies in Kenya showed that if untreated nets are used in a relatively good condition, they can still protect against malaria , and nets were labeled as intact when having no visible holes, satisfactory when having less or equal to five small hole and worn out if otherwise (26, 31). In one of these studies, as criteria to label a net as being in good condition, being long enough to be tucked in under the mattress and having no more than five small holes and sized 2cm or less were used(26).

2.3 Possession and use of ITNs

Studies on the other hand have repeatedly indicated existence of improper practice in using the nets. In a study conducted in western Kenya to assess factors affecting ITNs use during a trial approximately 30% of the nets already in the households were unused (16). Adherence in this study meant that corners of a rectangular ITN are attached to the eaves and walls of the room; users lower the ITNs before sleeping and tuck them in under the bed or mat (16). In a study conducted in Kenya to assess the impact of untreated mosquito nets 21% of the nets were worn (31). In another study conducted in Uganda, among non users of ITNs 18% had used in the past but not at the time of the study. Cost, reduced risk of exposure to malaria and inconvenience were their main reasons (20).

In a trial in western Kenya, one month after pretreated net distribution, approximately half of the ITNs were not being used (32). It was reported that parents sleep on a bed with a mattress and have priority access to the only mosquito net in the household, if one exists (32). In 69 surveyed regions for 12 countries in Africa ITNs possession varied between 0.1-25.5%. The corresponding uses during the preceding night by children under five years of age was 0-16%. Children's use increased with possession. In a linear fit use was 0.55 as high as possession. Possession could predict child use within a 95% CI of 4-5% points for ITNs (13).

A comparative cross-sectional study in Kafta-Humera District, Tigray explored; Net and ITN possession was 84.5% and 80.0% for rural, but 96.1% and 91.1% for urban settings, respectively. Net possession was higher among urban compared to rural areas. Observed net and ITN use during the preceding night by children under five years of age was 68.6% and 67.0% for rural; and 84.6% and 79.5% for urban areas, respectively. Likewise, similar practice for net and ITN in 52.1% and 64.7% of pregnant women was observed in rural and urban areas, respectively (33). The FGD results of this study suggested that lower net possession in rural areas could be due to insufficiency of mosquito net provision and inequity during distribution. Occupation, family size in rural areas; radio possession in urban areas and relative wealth and number of sleeping places had significant effect in both settings to own a net. Relative wealth, radio possession, malaria education message in rural and occupation in both settings had a positive effect on net use (33)

2.4 Cost of nets and their use

Possession of nets was seen as being markedly affected by their cost. In a study in Tanzania families with high income were almost three times more likely to have a mosquito net than those with low income (34). In a study pertaining to malaria related belief in Ghana, the main reason for the low mosquito net usage was cost (35). Perception of study participants in western Kenya was that nets were too expensive (19). In a study in highland Kenya, reason for not having a mosquito net was mainly financial (36). In Burkina Faso high cost of nets was the most frequently stated reason for not owning nets (17). The study in Kinshasa, Democratic Republic of the Congo ,Among 351 women interviewed at baseline, 115 (33%) already owned a bed net and 86 (25%) reported to have slept under the net the previous night. Cost was reported as the reason for not owning a net by 48% of the 236 women who did not own one. In multivariable analyses, women who had secondary school or higher education were 3.4 times more likely to own a net (95% CI 1.6–7.3) and 2.8 times more likely to have used a net (95% CI 1.3–6.0) compared to women with less education (37).

2.5 Seasonality and net use

Nets were not used all days in all seasons. Nets were used mainly in the cold rainy season and stopped when the mosquito population was perceived to be low (32). In three African countries net use was between 1.2 and 5 times higher in the rainy cooler months than in the dry and hotter months. The lower use in dry and hot months related to less mosquito nuisance and sometimes to the perceived greater discomfort of sleeping under a net in this season. Even in the malaria season, not all existing nets are being used, as shown in a number of in depth surveys that compared net use reporting with visual inspection of sleeping places. Observation in a social marketing program in Burundi showed that 29% of identified ITNs had not been hung for use during the malaria transmission season (13).

In a rural area in Burkina Faso, where malaria transmission is holo endemic, but markedly seasonal, 73% of respondent used their mosquito nets only during the rainy season (17). In Nicaragua in areas of high coverage, people slept under the net throughout the year; lower coverage was associated with seasonal use (15). The most common reasons for ITN non-use identified through the qualitative component of the study were: there are few mosquitoes around or malaria is not a serious problem; the ITN is no longer effective; ITN is in poor condition; the

ITN is being saved. Observations showed many ITNs hanging incorrectly, and some being used for purposes other than as a bed net (39).

2.6 Health beliefs and mosquito net use

Health belief pertaining to causation of malaria and role of nets is an important factor. In one municipality in Uganda people who used nets seen that favorable beliefs were important in predicting use of mosquito nets. Users were more likely to believe that mosquito nets prevent malaria and are worth their cost (20). In a study in Southern Ghana mosquitoes were incriminated by most respondents as cause of malaria. But many of those who share this concept and others who do not, believe that malaria can be acquired by other ways as the heat from scorching sun and any other heat related work, poor eating habit, constipation and others(35). In a study conducted in Rural Burkina Faso although most people mentioned mosquito as transmitter of malaria, humidity exposure to rain and cold were also mentioned as causative factors (17).

Another observation is that nets are perceived by many as means of protection to mosquito bite rather than malaria prevention. In a study to monitor community responses to malaria control measures in Nigeria, the proportion of people who perceived that mosquito net prevent malaria (22%) was less than those who believe in its prevention against mosquito bite (96%) (30). In Burkina Faso, all respondents were interested in future use of treated nets, since it provides protection against mosquito (87%) (17). Only minority (3%) stated better protection against illness (17). In a social marketing program in Tanzania the main motivation for use was mosquito nuisance rather than malaria control, with the use being largely seasonal (40).

2.7 Housing condition & family arrangement and mosquito net use

Few studies mentioned logistical problems of households to use nets. In Kenya sleeping arrangements were generally perceived as posing challenges, as sleeping areas for children in living rooms and kitchens require daily commitment to mount and dismount nets (32). The study in villages along Lake Victoria in western Kenya, mentioned sleeping arrangement was significantly associated with net use, Net use was significantly associated with bed availability, number of rooms and their interaction (41). In a study in Afghan refugees, 11% of the study

population slept on floor. For such people nets were suspended from ceilings or between four upright poles held in mud filled ghee cans (29).

Among technical problems mentioned in a study in Kenya was ‘no room to hang child’s net’ (16). Housing condition also appears to contribute to washing of nets. In a study in Latin America, 3 months after impregnation, 45% households in Nicaragua and a similar proportion in the other study had washed their treated nets. Reasons were dirt due to kerosene lamps, children’s excreta and dust (15).

2.8 Impact of Plasmodium species type on net efficacy

A study was conducted in Nicaragua, stated that in areas with a high proportion of *P.falciparum* infection, ITNs would probably reduce clinical malaria episodes (14). It is worth noticing that the degrees of effectiveness witnessed were attained through high coverage, mostly higher than 50%. In a trial conducted in Turkey, where *P. vivax* is the major strain, it was found that untreated nets did not confer significant protection against clinical malaria (42).

2.9 Conceptual frame work

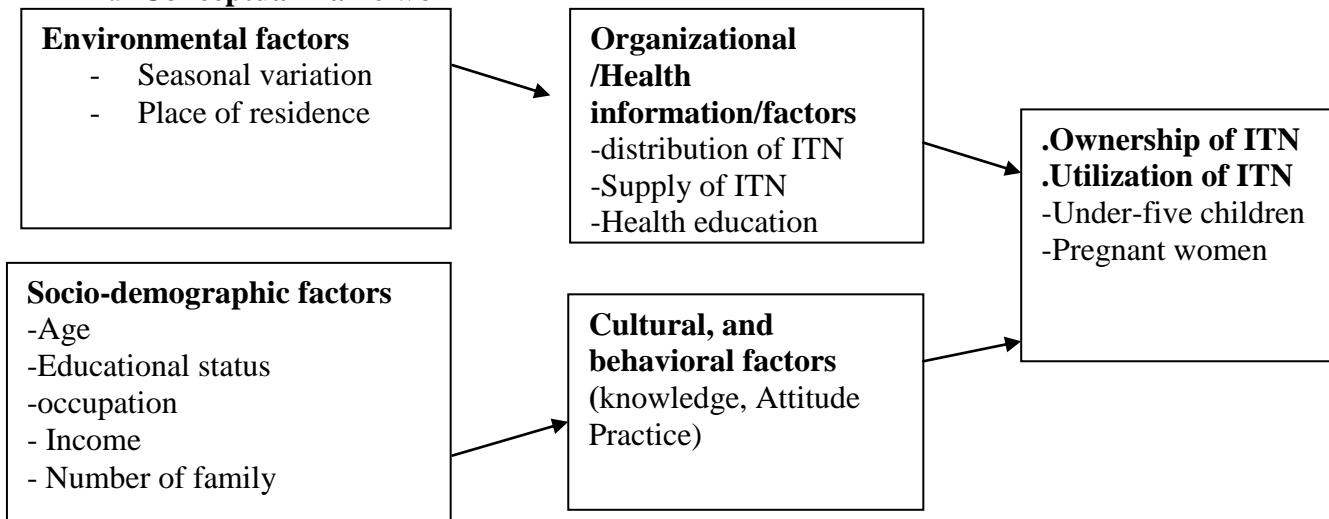


Figure 1: Conceptual frame work for factor affecting the utilization of ITNs among Children under 5 years of age and pregnant women in Shashogo Woreda, June 2011.

3. Significance of study

Malaria had been a major problem for Sub Saharan Africa and Ethiopia for long. The Roll back malaria initiative recognizing this problem , due to mass killing effect of ITN on vector it prevent the community and may also extend to non user ,ITNs are being distributed widely. But many field issues pertaining to their use are not answered in the Ethiopian situation.

The aim of this study is to identify factors affecting ITNS use of under five children and pregnant women households, by assessing the knowledge of the community about malaria and benefit of ITN ,the status of ITNS , and why it is not used among freely supplied households in Shashogo Woreda, Hadiya zone ,SNNPR . And used for refining ITN distribution program and for developing effective information, education, communication/behavior change communication (IEC/BCC) and to maximize the impact of ITNs in reducing malaria morbidity and mortality with regard to policy makers.

It also enables to share the experiences to practitioners, regarding the actual behavior of the community in utilizing ITN instead of reporting the distribution. This will help to shed light on the determinant factors for monitoring and evaluation of ITNs program; and formulate appropriate strategy for program implementation. It will also help us to scale up and maintain the coverage and utilization of ITNs. This implies that there must be selective targeting at household level so that children and pregnant women are protected.

In addition, as different studies had shown that majority of distributed bed net was not properly used. Their present status, the proportion; the utilization and why the net was not used were not well identified in this country and the whole Africa. Periodic assessment of the efforts and utilization among the high risk and priority group were highly recommended and in the study area there was no such a study conducted. Therefore this study is going to fill the gap in information.

Since, the use of the nets is related to perception, the view of the population; living style, housing condition, cultural and social belief, and behavior of the population, the actual utilization of ITN is determined. So that the qualitative method used in the study added to its relevance.

4. Objectives of the study

4.1. General objective

- To identify factors affecting Utilization of Insecticide Treated Nets among under- five years' old children and pregnant women in Shashogo Woreda.

4.2. Specific objectives

- ❖ To determine the proportion of under- five children who properly utilize ITNs.
- ❖ To determine proportion of pregnant women who properly utilize ITNs.
- ❖ To assess knowledge about malaria transmission and preventive measures.
- ❖ To identify socio-demographic, behavioral and organization factors that influence ITN utilization of under five children and pregnant women.

5. Methods and materials

5.1 Study area and period

Shashogo woreda is one of the 10 woreda of Hadiya zone and risk of malaria transmission; it has 102,464 of **total** populations and 23549 total households and a family size of 4.9. Out of this, males account 51777(50.53%) and females account 50,687 (49.47%).seven thousand five hundred twenty two (7.34%) population live in urban areas. From this 4,159 (55.29%) were males and 3,363 (44.71%) were females, and 94,942 (92.66%) population lives in rural area, of which 47,618 (50.15%) were males and 47,324 (49.85%) were females (From 2007 population and housing census) .The woreda has 38 total kebeles from which 36 were rural kebele and 2 were urban kebele. There are 5 health centers, 28 function health posts, 91 health professionals from different categories, 46 supportive staff, 65 RHEW and 3UHEW. The altitude of the woreda is <1500metre, and above 36% of climatic condition is kola (from zonal Annual Total performance report 2009).

The study was conducted in high risk malaria transmission area during peak malaria transmission period from March 10/7/-April 10/8/03.

5.2 Study design

A cross sectional study was conducted using both qualitative and quantitative methods. The data were collected using interviewer administered questionnaire and checklist to be filled by the data collectors regarding the condition of the nets. This was triangulated by qualitative approach to look into the reasons for improper use and institutional efforts to promote proper use. The qualitative approach was encompassing in depth interview of relevant stakeholders and focus group discussion of community members.

5.3 Population

5.3.1 Source Population:

The source of population was all households in urban and rural area in Shashogo Woreda

5.3.2 Study subjects:

For quantitative

The study subjects were under five children and pregnant women within the selected households of Shashogo woreda.

For qualitative

-Conveniently selected men and women who have at least one under five children and pregnant woman.

- Purposively selected important stakeholders in the malaria prevention and control activity and specifically in ITN distribution in Keble, woreda and zone.

5.4 Eligibility criteria

5.4.1 Inclusion criteria

For quantitative method

All households in selected Keble

For qualitative method

- Important stakeholders in the malaria prevention and control activity and specifically in ITN distribution in Keble, woreda and zone were included in-depth interview.
- Respondents who have at least one under five child and/ or pregnant woman were included in FGD.
- All respondents of the selected kebele should be resident for at least six month.

5.4.2 Exclusion criteria

- The respondents who did not fulfill the inclusion criteria.
- Those who were not willing to participate were excluded.

5.5 Sample Size Determination and sampling procedure

5.5.1. For quantitative method

5.5.1.1 Sample size determination

The required sample size for the study was determined by using single population proportion sample size calculation formula, assuming that one under-five child and a pregnant woman sleep under a net. An estimation of population proportion (p) is the proportion of households that

properly utilize ITNs for under-five children and pregnant women. Because of the approximation of households which utilize ITN properly in the area unknown, $p = 0.5$ was used, as this value gives sample size sufficiently large to guarantee an accurate prediction. The source population (households were 23549), which is $>10,000$, the following formula was used by applying 95% confidence level with 5% tolerable error.

$$n = \frac{(Z_{\alpha/2})^2 * p(1-p)}{D^2}$$

Whereas: n = sample size

$p = 0.5$ (proportion of HH that use properly utilize ITNs for under –five children and pregnant women), $Z_{\alpha/2} = 1.96$ (standard normal variable at 95% confidence level). $d = 0.05$ (Margin of error)

$$n = \frac{(1.96)^2 (0.5)(1-0.5)}{(0.05)^2} = 384 \text{ hh} \times 2(\text{design effect for multistage sampling}) = 768$$

768 case of unavailability of study unit, 5 % (38) of the total study sample was used as contingency. The total sample was 806.

5.5.1.2 Sampling procedure

The study units were identified using a multistage sampling technique.

Primarily, the source population was stratified in to two strata based on geographical homogeneity and history of malaria problem. The source of population was stratified in to 36 rural kebele and 2 urban kebeles with the population proportion of 92.66% and 7.34%, respectively. This was believed to increase representatives of the subjects as there might be differences in ITN utilization by type of residence, information, economic status and efforts from external bodies which causes variations. The primary sampling unit of kebele was selected by simple random sampling using the list of each cluster as sampling frame. 1 urban and 5 rural Kebles were selected considering ITN distribution proportion. This was believed to identify proper ITN utilization from ITN owners. The secondary sampling unit of numbers of households which were selected from each randomly selected kebele was determined by the proportion of households in the respective kebele. Housing number was given using ITN distribution sampling frame from the Woreda, it important to select representative subjects. In the situation where there are more one target groups in the household, one underfive child and pregnant women in the household was selected from each by lottery method. In the event of having more than one mosquito net owned by a household where child or pregnant woman existed, the one that

household use for under- five children and pregnant women were selected by lottery method and observed.

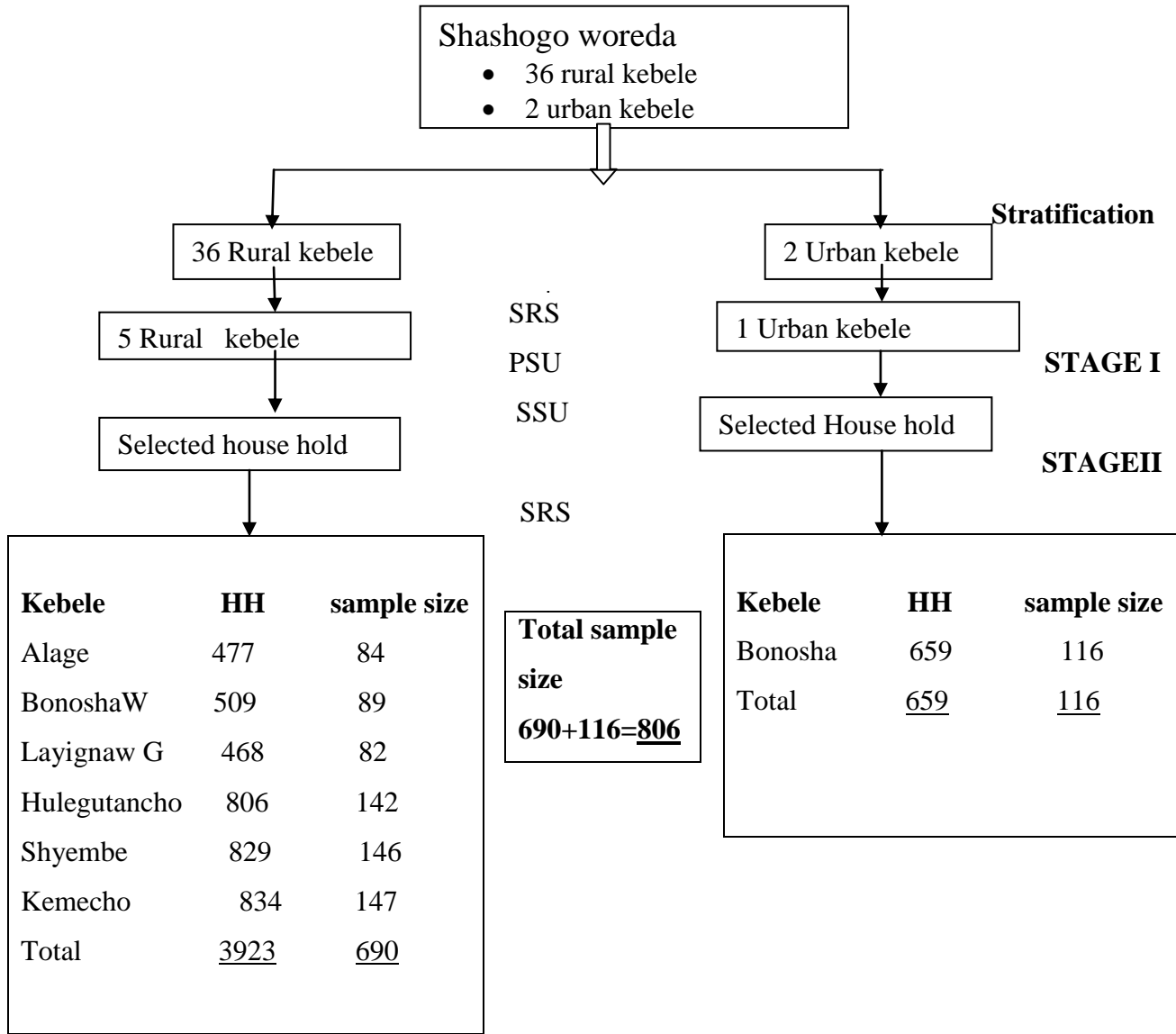


Figure 2 Schematic presentation of sampling procedure of household in Shashogo wored

5.5.2 For qualitative methods

5.5.2.1 Sample size determination

For in-depth interview:

Totally 3 key important stakeholders in the malaria prevention and control activity and specifically in ITN distribution in Keble, woreda and zone were selected purposely.

For FGD:

60 respondents of men and women who had at least one under five child or pregnant woman for minimum eight FGD was selected conveniently.

5.5.2.2 Sampling techniques

For key informant interview: (1) health leader of the kebele, (1) head of Woreda Health Department, (1) head of zonal health department were selected.

For FGD: eight FGDs, each consists of 6-9 members, 28 men in four groups, 13 men in two urban sites and 15 men in two rural sites; whereas 32 women in four groups, 16 women in two urban sites and 16 women in two rural sites were selected.

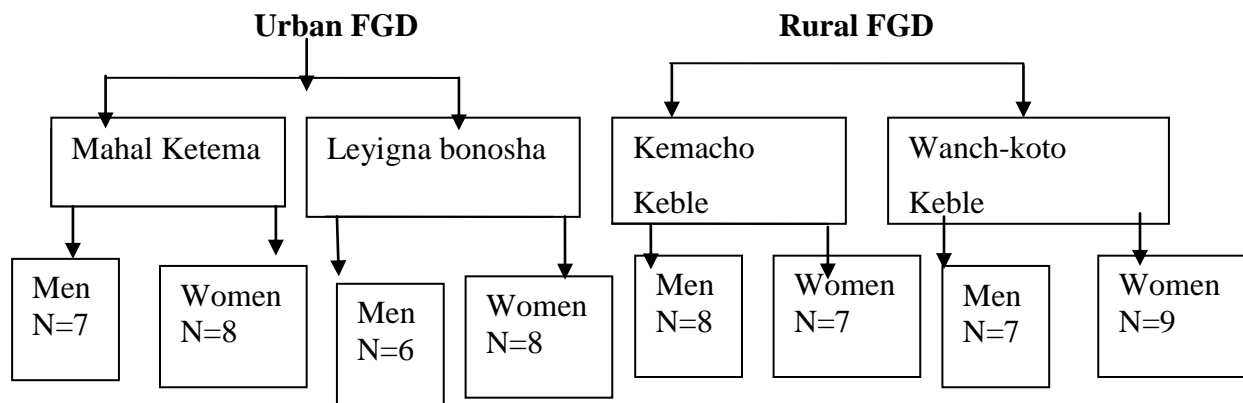


Figure 3 Schematic presentation of FGD site in Shashogo woreda

5.6 Study Variables

5.6.1 Independent variables

Socio-demographic

- Age of the head of house, Sex, educational status, family size, income.

Health information access

- Possession of radio, possession of television, information on malaria/ITNs by health professional.

Behavioral

- Knowledge about malaria, perception on susceptibility to malaria, perception on severity of malaria, knowledge and perception about ITNs.

Effort of health institution

- Number of nets distributed, messages pertaining on use, availability of ITN in the household (possession).

Environmental

- Type of living room , Place of residence , Season of the year

5.6.2 Dependent variables

- Using ITN the previous night.

5.7 Quantitative methods

5.7.1 Data collection techniques

The questionnaire was pre tested in (80)10% of study unit in Lissana woreda, which was out of the study area, some items of questions were modified accordingly. Sixteen 12⁺ students, were recruited on the basis of educational, ability to speak the regional working language (Hadiygna), and they were trained how to use check list and questionnaire by the principal investigator and assigned for each Keble. Then data collectors interviewed household heads (their spouses of households were interviewed if the head is absent). At the same occasion data collectors inspected any bed net for pregnant woman and under-five children in the household and filled the checklist. One check list was used for one net and size of holes and tears were measured using a ruler .When the respondent was not found, two visits were done before going to the next

house. The questionnaire was translated from Amharic to Hadiyigna language and then back to English.

5.7.2 Data collection instrument

A structured questionnaire and checklist, which was adapted from a study in Uganda and modified (18), was used. Main points included were socio-demographic characteristics, knowledge on malaria and nets, pertinent health beliefs and possession and use of nets by the family members.

5.8 Qualitative data

5.8.1 Data collection technique

The selection of FGD points, note taking, and tape recording was mediated by principal investigator. Respondents were men and women who had at least one under five child or pregnant women. A minimum of eight FGDs (four for men and four for women) were conducted and the number was increased until the point of redundancy. Respondents were selected making sure that their residences are fairly distant and evenly distributed in the different kebele of Woreda. Respondents of in-depth interview were important stakeholders in the malaria prevention and control activity and specifically in ITN distribution in Keble, woreda and zone.

5.8.2 Data collection instrument

FGD guidelines and in-depth interview guideline, which was prepared by principal investigator, were used. The FGD guidelines were translated in to local language (Hadiyigna). The points of discussion were sleeping habits, malaria as a problem, means of prevention of malaria, distribution and use of nets, reasons for different patterns of use and others. The principal investigator was collecting the information from the key informant using in-depth interview guide line tools. Its discussion points were magnitude of malaria, control and prevention strategies, role of ITNs, source and method of distribution of ITNs, appropriateness, affordability, and other issues pertaining to utilization of nets, studies addressing the above issues.

5.9 Operational definition of terms

- **Tear** – Loss of integrity of a net that communicates with the edge and greater than 2 centimeters.
- **Hole**- Loss of integrity or opening of a net that does not communicate with the edge and is greater than 1 centimeter.
- **Worn out net** - a net that was not hanged and was labeled by the respondent as no more useable.
- **High risk group**: all pregnant woman and under five children
- **Access to health information**: possession of at least one means of communication.
- **Proper ITN Utilization** is the proportion of pregnant women and under-five children that owned ITNs in the household, report to have slept under the net the night preceding the study. The ITN should had been treated once or twice a year or after every three washes, or if it had been treated with long-lasting insecticide for three to five years or twenty washes, and no unusual holes and tear.

5.10 Data quality assurance

5.10.1 For quantitative:

In order to ensure the quality of the data; structured and pre-tested questionnaires and check lists were used to collect information. One days training was given to all data collectors and orientation was given to supervisors to have common understanding on data collection process. Pre-test was done before actual study conducted near to the study area in Lissana Woreda on (80)10% of the respondents for three days to check the appropriateness of the questionnaire. Filled supervision was done and questionnaires were checked for completeness every night at the time of data collection and incomplete ones was sent back to the data collector. Feedbacks on previous day activities were given for data collectors. Checking the outlier, handling missing value, using the codebook and sorting of the data were done during data processing and analysis. Data was edited and cleaned before data analysis

5.10.2 For qualitative:

By principal ivestigator prepared and transilated FGD guideline and indepth interview were used. The respondent was interviewed by principal investigator by using tape recording and manual coding was done using themes.

5.11 Data processing and data analysis

5.11.1 For quantitative data:

After data collection, each questionnaire was checked for competence and code was given before data entry. Data were cleaned and entered into computer and the analysis was done using SPSS version 16.0. Different frequency table, charts, graphs and descriptive summaries were used to describe the study variable. Binary logistic regression was performed to assess the association each major independent variable with outcome variable. Then those variable that show significant association with the outcome variable ($p < 0.05$) was include in single model and multiple logistic regression was performed to identify the independent predictor of readiness.

5.11.2 For qualitative part:

The respondent was interviewed by principal investigator by using tape recording. The transcribed note was translated from Hadiyigna to English. Following this manual coding was done using themes.

5.12 Ethical consideration

After ethical clearance was taken, legal letter was obtained from Jimma University and submitted to concerned bodies. Depending on the official letter obtained from the department of community health; informed consent was obtained from the study population. Additionally during data collection the purpose of the study and issue of confidentiality was well explained. Preliminary finding will be communicated to the relevant stakeholders.

5.13 Communication and dissemination of findings.

Results will be present to the Jimma University scientific community and submitted to the Department of Community Health and it will also be communicated with local health planners and other relevant stake holder in the area to enable them takes recommendation into account during their planning. In addition, effort will be exerted to publish the paper and critiques that will be written based on the practical exposure.

6. Results

A total of 806 households were included in the study, and giving a response of 100%, the respondents being either the head of the household or the spouse. Six hundred two (74.7%) were males while 204(25.3%) females. Three hundred seventy five (46.5%) were in the age category of 31-45 years and the mean age of the respondents was 36.04(St.Dv +/- 9.7) years. Among the total respondents 396(49.1%) were illiterate, 129(16.0%) were able to read and write, 203(25.2%) had attended primary education, 62(7.7%) were secondary, 16(2.0%) were tertiary. Four hundred forty eight (55.6%) were Muslims, 708(87.8%) were farmers, 734 (91.1%) had < 500 Ethiopian Birr/month, 162(20.2%) of the households had a family size of 4 person or lower, 282(41.5%) households had two ore more under five children, 682(84.6%) had bed (Table 1).

The coverage of ITN was 793(98.4) of this 427 (43.0%) had at least two ITNs. From the total coverage, 730 (92.1%) were LLTNs and 781(98.5 %) obtained freely. The proportion of ITN for under five children and pregnant woman were 306(45.0%) and 162(86.6%), respectively. From 173(21.5%) households that had pregnant woman and under-five children, 94(54.3%) had net, 74(78.7%) used the available net, 35(47.3%) slept under ITN the previous night. This is supported by qualitative study result a 35 years old male respondent stated, “...*Although it is supposed to serve for longer years, the net color changes into black due to smoke within one year because we had domestic animals, kitchen, sleeping place in one house. So we need other design and frequent net supply. Don’t wait more than one year for the supply*”.

Table 1: Socio-demographic characteristics of the respondents, Shashogo Woreda in malarial areas of Hadiya zone, SNNPR, June 2011

Variables		frequency (n=806)	Percent
Age	18-30	312	38.7
	31-45	375	46.5
	46-60	104	12.9
	>=61	15	1.9
Religion	Protestant	312	38.7
	Orthodox	46	5.7
	Muslim	446	55.6
occupation	Farmer	708	87.8
	Merchant/trade	52	6.4
	Government employee	19	2.4
	Daily labair	19	2.4
	Other	8	1.0
Place of residence	Urban	116	14.4
	Rural	690	85.6
Number of under five(n=680)	One	397	58.5
	Two or more	382	41.5
Educational status	Illiterate	396	49.1
	Read and write	129	16.0
	Primary (1-6)	203	25.2
	Secondary (7-10/12)	62	7.7
Number of family	Teritiary	16	2.0
	<=4	163	20.2
	>=5	643	79.8
Monthly income	<500	734	91.1
	500-1000	66	8.2
	>1000	6	0.7
Sex of respondant	Male	602	74.7
	Female	204	25.3
Number of net(n=793)	One	366	57.0
	Two or more	427	43.0
Source of net	Free	781	98.5
	Bought	12	1.5
Number of beds(n=682)	One	514	75.4
	Two or more	168	24.6
Had bed	Yes	682	84.6
	No	124	15.4
Had net	Yes	793	98.4
	No	13	1.6
Type of net(n=793)	Re-treatable	63	7.9
	Permanent	730	92.1

Knowledge of respondents about malaria transmission and ITN use

Among the total respondents (n=806), 423(56.0%) used ITN for physical barriers, 754(93.5%) had awareness of ITN, 192(23.8%) believed sleeping under a net causes any problem, 292(36.2%) and 661(82.0%) believed that malaria frequently affects pregnant woman and under five children respectively, 417(52.6%) used ITN to prevent malaria.

The reasons for not using bed net stated by those who were not using bed net (n=40) were it is too hot 15(37.5%), mosquitoes still bites through the net 4(10%), difficulty to get up at night 9(22.5%), it takes time to tuck 10(25%), there is no enough air 2(5%) (Table2).

The reasons for not using ITN identified through the qualitative study also support this is, A 25 years female mentioned “...if it is used in dry season, it causes hotness and suffocation.” A 30 years old female, said “... if there is ceremony, discomfort due to different reasons, like grief, visitors (guest), delivery of wife using the bed and net will be changed”

Table 2: Knowledge of respondents about the transmission mechanisms and preventive measures of malaria, ITN use in Shashogo Woreda, Hadiya zone, June 2011

Variables		Frequency (n=806)	Percent
Malaria prevented by	Using ITN	417	52.6
	Using drug	277	34.9
	Removing the source	148	18.7
	Using ISR	482	60.8
Mechanism of action	Physical barriers	423	56.0
	Kills mosquito	445	58.9
	Irritate mosquito	325	43.0
Reasons not using the available ITN (n=40)	Too hot	15	37.5
	Mosquitoes still bite through the net	4	10.0
	It takes time to tuck	10	25.0
	There is no enough air	2	5.0
	Difficult to getup in night	9	22.5
Does sleeping under a net cause any problem	Yes	192	23.8
	No	614	76.2
Do you know cause of malaria	Yes	770	95.5
	No	36	4.5
Malaria transmitted from person to person	Yes	695	86.2
	No	111	13.8
Do you have malaria eduction	Yes	691	85.7
	No	115	14.3
Do you know benefit of ITN	Yes	754	93.5
	No	52	6.5
Malaria frequently affects	Under five	661	82.0
	Pregnant woman	292	36.2
	Old age	115	14.3

Among 306(45.0%) households that had ITN, 275(90.0%) used it, 225(82.0%) used it throughout the year, 170(61.8%) utilized ITN the previous night. It was also observed that out of ITNs use the previous night 130(60.8%) were hanged on bed, 58(62.4%) had hole, 51(66.2%) had hole size greater than 1 cm, 58(63.0%) had tear, 42(64.6%) had tear size greater than 2cm (Table3). However the proportion of under –five who used ITN properly the previous night were 76(44.7%).

This is supported by in-depth interview results, which showed that some households used net under the mattress in order to kill the other insects, priority was given to head of the households, only one net was used, but others were packed for another time, some are inappropriately hanged net due to housing condition (crowded the house), some were used for other purposes. Due to the crowdedness of the house the color of most nets was changed in to black which due to soot (table 3).

Table 3: Insecticide treated bed net utilization among under-five children and condition related to their bed net in Shashogo Woreda, Hadiya zone, June 2011

Variables		Frequency (n=806)	Percent
Do you have under five in your house	Yes	680	84.4
	No	126	15.6
Child have the ITN(n=680)	Yes	306	45.0
	No	374	55.5
Child use the available ITN(n=306)	Yes	275	90.0
	No	31	10.0
Condition of using the available ITN(n=275)	Continuously throughout the year	225	82.0
	Intermittently	50	18.0
Did the child utilize the ITN previous night(n=275)	Yes	170	61.8
	No	105	38.2
Condition of net(n=275)	Packed	7	2.5
	Hanged	264	96.0
	other	4	1.5
Hanged on (n=170)	Bed	130	60.8
	Floor	40	65.3
Had hole(n=170)	Yes	58	62.4
	No	112	61.0
Size of hole(n=58)	<=1cm	7	42.9
	>1cm	51	66.2
Had tear(n=170)	Yes	58	63.0
	No	112	60.1
Size of tear(n=58)	<=2cm	16	59.3
	>2cm	42	64.6
Did the child utilize the ITN properly the previous night (n=170)	Yes	76	44.7
	No	94	55.3

Among 170 (61.8%) children who used ITN the previous night, 115 (66.1%) had two or more ITN, whereas 55 (32.2%) had one ITN. This difference was significant [COR (95% CI) = **0.565(0.338, 0.945)**]. Children who used ITN the previous night thirty seven (90.2%) were urban, whereas 133 (56.8%) were rural. This difference was statistically significant [COR (95% CI) = **7.024(2.429, 20.448)**] (Table 4).

All variables that were significantly associated with ITN used on bivariate analysis were entered into a multivariable backward regression model. The result showed that awareness of ITN, access to health information, and the belief that using a bed net causes any problem were independent predictors of ITN utilization for under-five the previous night.

Those who had access to health information in the household were 3.452 times more likely to utilize ITN for under-five the previous night [AOR (95% CI) = **3.452(1.227, 9.716)**]. While those who had awareness of ITN benefits were 10.049 times more likely to utilize ITN for under-five the previous night (95% CI) = **10.049(1.118, 90.351)**. However, the belief that using a bed net causes any problem was found to decrease the odds of ITN utilization for under-five the previous night [AOR (95% CI) = **0.286(0.138, 0.594)**] (Table 4).

Table 4: Bivariate and Multivariable predicting the odd of ever sleeping under a net in previous night for under five children in household in Shashogo Woreda, Hadiya zone, June 2011

Variables	Ever sleeping under net in previous night		COR (95% Confidence interval)	p-value	AOR (95% Confidence interval)	p-value	
	yes	No					
Place of residence	Urban	37	4	*7.024(2.429,20.448)	<0.001	0.308 (0.85, 1.115)	
	Rural	133	101	referent category		referent category	
Awareness of ITN	Yes	169	83	*44.795(5.935,338.072)	<0.001	* 10.049(1.118,90.351)	0.039
	No	1	22	referent category		referent category	
Number of ITN	One	54	45	*0.565(0.338,0.945)	0.03	0.586(0.285, 1.206)	
	Two or more	116	57	referent category		referent category	
Does Net cause any problem	Yes	20	51	*0.141(0.077,0.258)	<0.001	* 0.286(0.138,0.594)	<0.001
	No	150	54	referent category		referent category	
Access of health information	Yes	163	78	*8.060(3.363,19.317)	<0.001	* 3.452(1.227,9.716)	0.019
	No	7	27	referral category		referent category	
Shape of net	Rectangular	157	90	referent category		referent category	
	conical	7	13	*3.240(1.247,8.416)	0.043	1.869(0.551,6.343)	
Malaria is preventable	Yes	167	98	*3.976(1.005,15.731)		2.285(0.439,11.887)	
	No	3	7	referent category	0.021	referent category	

Among 162(86.6%) household that had ITN, 141(87.0%) used the available ITN, 102(72.3%) used the available ITN throughout the year, 88(62.3%) utilized ITN the previous night. Observation showed that from ITN utilized the previous night 68(65.7%) were hanged on bed, 22(66.7%) had hole, 21(70%) had > 1 cm hole size, 20(64.7%) had tear, 17(68.0) had > 2cm tear size (Table5).

However, the proportion of pregnant woman utilized the ITN properly were 50(56.8%) the previous night. This is supported by qualitative finding in FGD; both groups agreed that structure of the house and size of house with shape (rectangular) of net did't match. A 42 years male said "...when had greater than two net. they need more place for hanging with extra material in one room, which made crowdedness of the house."

Table 5: Insecticide treated bed net utilization among pregnant woman and condition related their bed net in Shashogo Woreda, June 2011

Variables		Frequency (n=806)	Percent
Do you have e pregnant woman in your house	Yes	187	23.2
	no	619	76.8
Pregnant woman have the ITN(n=187)	Yes	162	86.6
	No	25	13.4
Pregnant woman use the available ITN(n=162)	Yes	141	87.0
	No	21	13.0
Condition of using the available ITN(n=141)	Continuously throughout the year	102	72.3
	Intermittently	39	27.7
Did the Pregnant woman utilize the ITN previous night(n=141)	Yes	88	62.3
	No	53	37.7
Hanged on (n=88)	bed	68	65.7
	floor	20	58.3
Bed net condition (n=141)	packed	4	3.0
	hanged	133	94
	other	4	3.0
Had hole	Yes	22	66.7
	No	66	63.6
Size of hole	<=1cm	1	33.3
	>1cm	21	70.0
Had tear	Yes	20	64.7
	No	68	63.7
Size of tear	<=2cm	3	50.0
	>2cm	17	68.0
Did the Pregnant woman utilize the ITN properly the previous night (n=88)	Yes	50	56.8
	No	38	43.2

Among 88(62.3%) pregnant woman utilized ITN the previous night, 87(68.0%) had the awareness of net. The difference was statistically significant [COR (95%CI) = **25.463(3.202, 202.502)**]. Thirty five (80.0%) had greater than two beds, whereas 53(59.5%) had one bed. This, difference was significant [COR (95%CI) = **0.368(0.151, 0.894)**], and 14(93.3%) were from urban residence, whereas 74(58.7%) were rural. This, difference was significant [COR (95%CI) = **9.838(1.254, 77.151)**]. Eighty one (72.3) believed that bed net does not cause any problem, whereas 7(24.1%) believed bed net causes a problem. The difference was statistically significant [COR (95%CI) = **0.122(0.047, 0.314)**] (Table6).

When entering variables that showed significant association in the bivariate model into multivariable back ward logistic regression, age of the respondents and access of health information were independent predictors of ITN utilization for pregnant woman the previous night. Those who had access to health information were 6.454 times more likely to utilize ITN for pregnant woman the previous night [AOR (95%CI) =**6.454(1.964, 21.205)**]. But, when the age of respondents increased, the Odds of ITN utilization the previous night decreased [AOR95%CI) = **0.309(0.102, 0.934)**] (Table6).

Table 6: Bivariate and Multivariable predicting the odd of ever sleeping under a net in previous night for pregnant woman in household in Shashogo Woreda, Hadiya zone, June 2011

Variables	Ever sleeping under net in previous night		COR (95% Confidence interval)	p-value	AOR (95% Confidence interval)	p-value	
	yes	No					
Age in years	18-30	25	29	referent category		referent category	
	31-45	48	18	*0.323(0.151, 0.692)	0.004	*0.309(0.102, 0.934)	0.037
	46-60	15	6	*0.345(0.116,1.023)	0.050	0.229(0.049,1.063)	
Place of residence	Urban	14	1	*9.838(1.254,77.151)	0.03	0.433(0.135, 1.391)	
	Rural	74	52	referent category		referent category	
Awareness of ITN	Yes	87	14	*25.463(3.202,202.502)	0.002	0.108(0.011,1.024)	
	No	1	12	referent category		referent category	
Number of bed	One	50	34	*0.368(0.151, 0.894)	0.027	0.985(0.472,2.054)	
	Two or more	32	8	referent category		referent category	
Sleep under a net cause a problem	yes	7	22	*0.122(0.047, 0.314)	0.04	2.33(0.464,11.769)	
	no	81	31	referent category		referent category	
Access of health information	yes	80	31	*7.097(2.859,17.617)	<0.001	*6.454(1.964,21.205)	0.002
	no	8	22	referent category		referent category	

7. Discussion

In this study, the Coverage of ITN was found to be 98.4%. However, the coverage with at least two ITN was 43.3 %. This finding was higher than the coverage of 28.9% with at least two ITN in Arbaminch zuria in 2009, and the coverage report of the Ethiopia DHS in which there were 24% in 2005(43, 38). This might be, due to the reason of 92.1% of net were LLTNs, and 98.5% household got them freely, so they can utilize for a long period of time and have access to ITN than purchasing and using re treatable net. On qualitative approach in in-depth interview identified results were , ITN distribution system was blanket coverage system (covering all household with at least 2 ITN) by considering number of person per household; (1 ITN for 1-3person/household; 2 ITN for 3-6person/ household; 3 ITN for >6 person/ household).

But the coverage was less than the national strategic plan of the Federal Ministry of Health (3), which aim to attain coverage of 60% with at least two ITN by 2007(3) , and the target plan for next five year (2006-2010) to achieve 100% Of coverage with at least one ITN(7). This might be due to the fact that, 7.9% were re treatable nets, 16.9% were being utilized for other purposes, and 31.7% had tear. Qualitative result a 25 years female respondent said”... *at the time of distribution they did not considered the number of children, presence or absent of nets in household and household that have pregnant women .But, they simply distribute the net for all people..*”

In this study, Proportion of ITN for pregnant woman and under- fives were 86.6%, 45.0%, respectively and using the available ITN by pregnant woman and under fives were 87.0%, 89.9%, respectively. Regarding ITN uses 62.3% pregnant woman, 61.8% under-five used ITN the previous night. But the proportion of proper ITN use the previous night for pregnant woman and under-five were 56.8%, 44.7%, respectively. This figure is higher than the finding of other studies (1, 5, 21, 33, and 38), which might be due to the reason that cost of nets was seen as being too expensive (34, 35, and 19). One possible explanation is that the majority of the nets were obtained freely through the local health authority. The net owners might have been provided with appropriate health information regarding the use of ITN during the provision of the nets. The presence of health extension workers and voluntary malaria prevention and control committee in all the study “Keble”, could be another explanation.

The knowledge of respondents about the preventive measures of malaria was 52.6% which is less than study carried out in Tigray, 70% knew that mosquito net use could prevent malaria (24). This might be the reason that different in study population, area and sampling size. But, higher than only 13% mentioned mosquito net use as a preventive measure in rural community study in Butajira (25). This difference is described by being rural residence has less access to mass media and low socio-economic trait.

In this study, numbers of nets, number of beds, place of residence, awareness of ITN, belief about ITN, access to health information, age of the respondents were significantly associated with ITN utilization the previous night. But, occupation, educational status, family size, income, number of under-five was not associated with ITN utilization (34, 35). This might related to the fact that ITN is given and the type of net obtained (permanent net).

But having awareness of ITN, belief about ITN, and access to health information were found to be independent predictors of ITN utilization, that is having awareness of ITN, and access to health information were associated with increasing odds of ITN utilization the previous night. This could be explained by the possible increase in awareness of mosquito nets and their advantages, and probably better comprehending capability of mass media message related to mosquito net. Qualitative approach was identified in FGD, a woman whose age was 40 years, said that “... *I obtained the information about how to hang the net, but I don't know how long can use it and how often I can wash it. So at least after distribution the concerned body should follow it up and before distribution they should give education for all users.*”

Belief of net causes any problem was found to decrease the odds of ITN utilization for under – five the previous night. This could be explained by decreasing in awareness of mosquito nets and their advantages, which might be affected by educational level, almost half of respondents (49.1%) were illiterate. Age of respondent was another predictor for pregnant woman ITN utilization; with an increasing age of the respondent, the odds of ITN utilization the previous night for pregnant woman to decrease. This might be due to, only few (14.3%) of respondent believed that malaria affect frequently old age

8. Strength and limitation

Limitation:

Observer bias might be introduced during measuring of tear and hole size

Strenght:

- Large sample size
- Both quantitative and Qualitative study was used
- Valid questionnaire and check list was used

9. Conclusion and recommendation

The coverage of ITN in the study area was high when compared to the results of studies conducted in different part of the country previously. But, low when compared to the target plan for next five year (2006-2010) to achieve 100% of coverage with at least one ITN. There was a wide gap between possession and proper utilization of ITN for high risk group. Having awareness of benefit of ITN, belief ITN does not causes any problem, were found to be important predictor for under five children ITN utilized the previous night. Access to health information was identified to be independent predictor for both under five children and pregnant women ITN utilized the previous night. But, age of respondents was found to be important predictors for only pregnant women ITN utilized the previous night. The house structure and size of the room didn't correspond with the shape of the net and even if it LLTNs due to the housing condition, it hadn't serve for long period of time. Based on the finding the following issues were recommended.

For FMOH and NGO:

- They should develop appropriate IEC/BCC intervention and promotion activities to narrow the gap between coverage and utilization of ITN for pregnant woman and under-five.
- Sustainable supply and extra ITN in market should be accessed.
- They should avail appropriate ITN design by considering housing condition and sleeping area.

For zonal health department:

- They should give training for health professionals.
- They should supervise and evaluate the work of ITN continiously.

For Woreda health department:

- They should give proper guideline for owners of ITN during provision of ITN
- They should continuously follow up ITN utilization after distribution.

For health institutions and HEW:

- They should demonstrate net how it hangs, tack, and wash it.
- Observe the net frequently whether properly hanged/used or not.

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11. Annex

11.1 Questionnaire Interviewers' Guideline

Introduce yourself:-

Hello, I am _____ and I am working in ----- .Then explains the purpose of the study to respondents by saying that “the reason why I came here is to ask you some questions related to malaria. The purpose of this interview is to have your opinion on the bed nets. This in turn will help to design the intervention to tackle the transmission of malaria. After the explanations select the proper respondents, who was the head of the household or in the absence of head select their spouse, for the interviewing. If the respondent is not found do at least two repeat visit before going to the next house.

Informed consent

Read the following paragraph for the selected person.

”To conduct our study, I would like to ask you some questions. I kindly request you to give me your sincere and truthful answer.

All the information that you are going to give me will remain confidential and you have the right to not give the response, but your input has great value for the success of our objective.”

Name of the head _____ Age _____

Signature of interviewer _____ Date _____

Signature of the supervisor _____ Date _____

S. Number _____

Kebele _____

Thank you for your cooperation!!!

General instruction

Almost all questions are pre-coded and categorize into socio demographic and economical data, brief knowledge, attitude and practices on malaria prevention, bed net use practice, sleeping patterns.

- If ≥ 2 under five children is present in the household, select one by lottery method.
- Use clear hand writing for filling blanks.
- Ask one question at a time.
- Give the time for the respondents
- Circle the answers of the respondents
- Take care of the skips answer and continual responses.
- Guide and provoke the respondents for some recalling questions.

1) Socio-demographic and economic data

S. N	Questions	Coding	Skip
1	Age of respondent in year		
2	Sex of respondent	1. Male 2. Female	
3	Place of residence	1. Urban 2. Rural	
4	Religion of respondents	1. Protestant 2. Orthodox 3. Muslim 99. Other(specify)	
5	Educational status of head	1. Illiterate 2. Read and write only 3. Primary (1-6) 4. Secondary (7-10/ 5. Tertiary level	

6	Occupation of the head	<ol style="list-style-type: none"> 1. Farmer 2. Merchant/trader 3. Government employee 4. Daily laborer 99. other (specify) 	
7	Estimated monthly income of the household(Birr)-----		
8	Number of under five children in the family	<ol style="list-style-type: none"> 1. zero 2. one 3. two or more 	
9	Number of family in the household	<ol style="list-style-type: none"> 1. four or less 2. => five 	
10	Type of roof of the house	<ol style="list-style-type: none"> 1. corrugated iron sheets 2. Thatched roof 99. other(specify) 	
11	Type of wall of the house	<ol style="list-style-type: none"> 1. mud 2. cemented 3. only wood 99. other(specify) 	
12	Type of floor	<ol style="list-style-type: none"> 1. mud 2. cement 3. wood 99. other(specify) 	

II) Briefing on knowledge, attitude and practices on malaria prevention

S.N	Questions	Coding	Skip
13	Do you know the cause of malaria?	<ol style="list-style-type: none"> 1. Yes 2. No 	
14	If yes, what is that / or what are they?	<ol style="list-style-type: none"> 1. cold weather/water 2. exposure to rain 3. eating young sugarcane /corn/sorghum 4. evil spirit 5. mosquito bite 6. God cause it 	

		99. Other(specify)	
15	Can it be transmitted from one person to another?	1. Yes 2. No	
16	If yes, how?	1. Mosquito bite 2. Airborne 3. Contact with infected person 99 Other(specify)	
17	How can we prevent malaria infection (transmission)?	1. DDT spray 2. Source reduction 3. Drugs (prophylaxis) 4. ITNs utilization 98 I don't know 99. Other (specify)	
18	Who are at high risk of malaria in the Household?	1. Under five children 2. Pregnant women 3. Adults 4. Old age 99. Other (specify)	
19	At what time of the day do mosquitoes bite most?	1 The morning 2 the afternoon 3 the evening before bed time 4 at night in bed 5 all day 98. don't know 99. other (specify)	1

III) Bed net use practices

S.N	Questions	Coding	Skip
20	Do you have bed nets in your house?	1 yes 2 no	
21	If yes, where did you get it?	1. Woreda health office 2. Health center 3. Health post/clinic 4. Shops 5. NGO 99. other (specify)	
22	Did you pay for it?	1. Yes 2. No	

23	If yes, how much? (Birr) _____		
24	What type of bed net do you have?(if your answer is 2 skip to QN ^o 35.)	1. Re treatable 2. Permanently treated 99. other(specify)	
25	If your answer is 1 for question N ^o 24 when did you obtain it? Write the exact date in day/month/year by mm/dd/yy		
26	Do you know that the net should be retreated?	1. Yes 2. No	
27	If yes, after how many months of the first treatment/retreatment?		
28	Was it treated with an insecticide?	1. Yes 2. No 98. I don't know (Not sure)	
29	If yes, how many times?	1. Once 2. Twice 3. Three times 4. At least four times	
30	When was the last retreatment date?	1. < 6 months 2. 6-12 months 3. > 12 months (>1 year)	
31	Who is making the retreatment of the net?	1. Self/family member 2. Health worker at health institution 3. Shopkeepers 99. Other (Specify)	
32	Did you wash the net?	1 yes 2 no	
33	If yes, how frequent do you wash the bed net in the 6 months period?	1. Only once just before retreatment 2. Twice 3. 3-5 times 4. 6 or more times 5. Never	
34	Do you know that frequent washing can reduce the efficacy of the bed net?	1 Yes 2 No	
		1. Yes	

35	Do you know the benefit of a mosquito net?	2. No	
36	If yes, what are the benefits?	1. Prevents mosquito biting so that passing safe sleep 2. Prevents the nuisance by other insects 3. Prevents malaria 4. Gives warmth 99. Other (Specify)_____	
37	How does ITNs prevent malaria Transmission?	1. Physical barriers 2. Kills mosquito 3. irritate mosquito 98. Not known 99. If other, specify	
38	Dose sleeping under bed net cause any problem?	1. Yes 2. No	
39	If yes to QN ^o 38 above, what are the major problems?	1. No comfort 2. Cause heat 3. Air hanger 99. If other, specify	
40	Have you seen or heard any malaria education messages from any source?	1. Yes 2. No	
41	If yes, Where did you see or hear these education messages from?_____	1 Radio 2 TV 3 news 4 health professional 99 other	
42	What message or messages did you see or hear?	1. messages about preventin 2. messages about treatment 3. how malaria is transmitted 4. can't remember 99. other	

VI) Sleeping Patterns

43	Do you have bed in your house?	1. Yes 2. no	
44	If yes, how many beds do you have in your house?		
45	Do you have pregnant woman in your house?	1. Yes 2. no	

46	If yes, does pregnant woman have bed?	1. Yes 2. no	
47	Does pregnant woman have nets?	1. Yes 2. no	
48	If yes, does she use the available nets?	1. yes 2. no	
49	If yes, What was the frequency of using the nets?	1. constantly throughout the years 2. intermittently	
50	If she uses intermittently, when?	1. During rainy season 2. After rainy season 3. During dry season 4. As they like 5. When hearing mosquitoes buzzing	
51	Does she sleep under net the previous night?	1. Yes 2. no	
52	Do you have under- five children in your house?	1. Yes 2. no	
53	Does the child have their own bed?	1. Yes 2. No	
54	Does the child have nets?	1. Yes 2. no	
55	If yes, does the child use the available nets?	1. Yes 2. No	
56	If yes, what was the frequency of using the nets?	1. constantly throughout the years 2. intermittently	
57	If child uses intermittently, when?	1. During rainy season 2. After rainy season 3. During dry season 4. As they like 5. When hearing mosquitoes buzzing	
58	Does the child sleep under net the previous night?	1. Yes 2. No	
59	If under five child and pregnant woman did not sleep under a net why?	1. It is too hot 2. Mosquitoes still bite through the net 3. It is difficult if you want to get up in the night 4. It takes time to tuck the net each night 5. There is not enough air 6. Nets do not protect against malaria	

		99 . Other(specify)	
--	--	---------------------	--

11.2 Checklists

General instruction: This check list is used for the observation of the household's bed nets. If a child and pregnant woman have ≥ 2 bed net, select one by lottery method.

Before observation: Take the consent from the respondent.

What you observe is: Any thorn, hole, burn existence of net in HH and properly hanged by under five and pregnant women for those who own ITNs.

Conditions: Properly measure the tear of the net by using centimeter. And Count the number of the net hole.

Observation time: Early the morning before the member of the household go out of the bed.

Serial Number _____

Rural/ Kebele/ _____

Sr.no	Points to be observed	Coding	
60	The bed nets condition is	1. packed 2. hanged 99. other(specify)	
61	If hanged	1. is on bed 2. is on sleeping floor 99. other	
62	Shape of bed nets	1. rectangular 2. conical	
63	Color of bed nets	1. white 2. Green/blue	
64	Number of bed nets		
65	Is there any hole on the nets?	1. Yes 2. No	
66	If yes how many?		
67	Size of the largest hole		
68	Is there any tear?	1. Yes 2. No	
69	If yes, how many?		

70	Size of the largest tear		
----	--------------------------	--	--

11.3 Discussion point for FGD

- FGD guidelines for woman and men who have at least one under five children and pregnant woman in their house hold.

Introduction:

Thank you for coming to this session; your presence is very important. All your ideas, comments and suggestion are of great important for us. There is no wright and wrong answer; all comments both positive and negative are welcome.

Plcease disagree to one another when necessary. We would like to have many points of view.

Ask each participant to introduce him/herself.

Name, something about one's self, position, work residential Experience and other as desired.

Purpose: we will be discussing your reaction /perception and experience about the importance, impact, and challenging of insecticiding treating mosquito net.

Questions for discussion:

1. What are sleeping patterns of under-five children and pregnant women?
2. Is malaria a major problem? Why?
3. What are your knowledge, attitude and practice of malaria prevention measures?.
4. How was the bed nets distribution and supply in the areas?
5. Describe any messages to the public pertaining to bed nets.
6. How did people use and utilize the nets?
7. Who in the family gets priority in using it? Why?
8. Are there any advantages of sleeping under a net? What are they?
9. Are there problems that arise as a result of sleeping a net? What are they?
10. Are there barriers the use of bed nets? (Financial, housing condition etc)
11. How do you describe the condition of the nets already in the houses? Are they in good condition?
12. Do you think nets should be used in the future to prevent malaria in your locality?

11.4 Discussion points (for the in-depth interview)

1. Magnitude of malaria.
2. Preferred control strategies and the rationale.
3. Appropriateness of ITNs in the Ethiopian/local context (applicability, feasibility Sustainability)
4. Studies addressing the above issues.
5. Detail of currently on going activities pertaining to ITNs.
6. Presence and Quality of IEC activities
7. Presence and adequacy of training to health workers.
8. Financial and technical capability of the institutions to sustain supply a nets
9. Source and methods of distribution of the ITNs.
10. Status of nets that are already in the households.
11. Points that should be rectified in the future.

የዉል ስምምነት

ሄሎ: እኔ _____ እባላለሁ እኔ የሚሠራዉ በ _____ ነዉ:: ከዚያም በመቀጠል የጥናትን ዋና አላማ እንድህ ብለዉ ይግለጹ:: “ይህ መጠይቅ የወባን በሽታ በተመለከተ የአጎበር አጠቃቀም ምን እንደሚመስል የሚጠይቅ መጠይቅ ነዉ:: ይህም ትክክለኛ የሆነ የወባ በሽታ መተላለፊያ መንገድን የማጥፋት ሁኔታ እንዲመጣ የሚያስችል ነዉ”:: አላማውን ከገለጹ በኋላ በትክክል የቤት አባዎራውን ለይተው ይወቁ :: ከዚያም በኋላ መጠይቁን ይጠይቁ :: ከሌሉ ግን የቤት እማዎራውን ይጠይቁ :: ነገር ግን በዚያ ቤት ሰው ከለሌ ሌላ ቤት ከመሄድዎ በፊት ብያንስ ሁለት ጊዜ ይጎበኙ:: ይህንን ካደረጉ በኋላ ስምምነቱን ቀጥለዉ ባለው ሁኔታ ይግለጹ :: “ከዚህ በኋላ የሚሰጡት መልስ በጓደኝነት ፤ በመተማመን ና በእምነት እንድሆን እጠይቃለሁኝ” :: የሚሰጡ መልስ ደግሞ ምስጥር የተጠበቀ ነዉ:: በጥናቱ የመሳተፍም ሆነ ያላመሳተፍ መብትም የተጠበቀ ነዉ :: ነገር ግን የሚሰጡት መልስ ይህንን አላማ ለማሰካት ይረዳል:

: ስለዚህ ለሚጠየቁ ነገር ፍቃደኛ ነዎት ወይ?

1. አዎ
2. አይደለዉም

የአባዎራ ስም _____ ዕድሜ _____

የጠያቅዉ ስም _____ ፊርማ _____ ቀን _____

የሱፐርቪይዘር ስም _____ ፊርማ _____ ቀን _____

ተራ ቁጥር _____

ቀበሌ _____

ለትብብርዎ እናመሰግናለን!!!

መግቢያ

አብዛኞቹ ጥያቄዎች ቅድመ ኮድና ተለያይተው በማህበረሰባዊ ፣ በእኩኖሚያዊ መረጃ ፣ የወባን በሽታ መከላከያ መንገዶች ፣ የአጎበር አጠቃቀም ማሻሻያ ሁኔታዎች ያካተተ ነው።

- ሁለትና ከዚያ በላይ የሆኑ ከአምስት ዓመት በታች ሕጻናት ካሉ አንዳቸውን በሎተሪ ሁኔታ ይውሰዱ
- ግልጽ በሆነ እጅ ጽሑፍ ባዶ ቦታዎችን ይሙሉ
- አንድን ጥያቄ በአንድ ጊዜ ይጠይቁ
- ለመልስ ጊዜ ይስጡ
- መልሱን በአግባቡ ይክበቡ
- ለሚዘለሉና ቀጣይነት ላላቸው ጥያቄዎች ጥንቃቄ ያድርጉ
- ለአንዳንድ የሩቅ ጊዜ ማስተወስን ለሚጠይቁ መጠይቆች ማብራሪያ ይስጡ

1 የማህበረሰብ አኗኗርን በተመለከተ የሚጠይቅ መጠይቅ

ተቁጥር	ጥያቄዎች	ክድ	ይዘለል
1	ዕድሜ በዓመት		
2	ጾታ	1 ወንድ 2 ሴት	
3	ቦታ	1 ከተማ 2 ገጠር	
4	ሃይማኖት	1 ፕሮተስታንት 2 ኦርቶዶክስ 3 ሙስሊም 99 ሌላ ከሆነ ይግለጹ	
5	የትምህርት ደረጃ	1. የልተመረ 2. ማንበብና መጻፍ የምችል 3. ከ1 ^ኛ እስከ 6 ^{ተኛ} 4. ከ7 ^{ተኛ} እስከ 12 ^{ተኛ} 5. ከ12 ^{ተኛ} ና ከዚያ በላይ	
6	የሥራ ሁኔታ	1. ገበሬ 2. ነጋዴ 3. የመንግስት ሠራተኛ 4. የቀን ሥራ 99 ሌላ ከሆነ ይግለጹ	
7	በወር የሚገባ ገቢ በግምት		

8	ከ5 አመት በታች የሆኑ ሕጻናት ቁጥር	1. ዜሮ 2. አንድ 3. ሁለትና ከዚያ በላይ	
9	የቤተሰብ ነዋሪዎች ቁጥር	1. 4 ና ከዚያ በታች 2. 5 ና ከዚያ በላይ	
10	የቤት ጣርያ የተሰራው በምንድነው	1 በቆርቆሮ 2 በሣር 3 ሌላ ከሆነ ይግለጹ	
11	የቤት ግርግዳ የተሰራው በምንድነው	1 በጭቃ 2 በስምንቶ 3 በእንጨት 99 ሌላ ከሆነ ይግለጹ	
12	የቤት ወለል የተሰራው በምንድነው	1. ከጭቃ 2. ከስምንቶ 3. ከእንጨት 99 ሌላ ከሆነ ይግለጹ	

2 የወባ በሽታን መከላከያ መንገዶችን የሚጠይቁ መጠይቅ

ተ ቁጥር	ጥያቄዎች	ክድ	ይዘለል
13	የወባ በሽታ አምጪ ምክንያቶችን ያውቃሉ?	1 አዎ 2 አለውቅም	
14	አዎ ከሆነ ምንድነው ምክንያቶቹ?	1 በ ቀዝቃዛ አየር ወይም ወሃ 2 በዝናብ 3 አገዳ ነገሮችን በሙብላት 4 በሴይጣን 5 በወባ ትንኝ በመንደፍ 6 በእግዚአብሔር ቁጣ 99 ሌላ ከሆነ ይግለጹ	
15	የወባ በሽታ ከአንድ ሰው ወደ ሌላ ሰው ልተላለፍ ይችላል?	1 አዎ 2 አይችልም	
16	አዎ ከሆነ እንዴት?	1. ወባ ትንኝ በመንደፍ 2. በትንፋሽ 3. በንኮኪ 99 ሌላ ከሆነ ይግለጹ	

17	የወባን በሽታ እንዴት መከላከል እንችላለን?	<ol style="list-style-type: none"> 1. ዲዲቲ በመርጨት 2. መራብያ ቦታ በማጥፋት 3. መድኃኒት በመውሰድ 4. አጎበር በመጠቀም 5. አይታወቅም <p>99 ሌላ ከሆነ ይግለጹ</p>	
18	ከቤት ነዋሪዎች ውስጥ በብዛት በወባ በሽታ ሚጠቃው ማን ነው?	<ol style="list-style-type: none"> 1. ከ5 ዓመት በታች የሆኑ ሕጻናትን 2. ነፍሰጡር እናቶችን 3. አዋቂዎችን 4. በዕድሜ የቆዩትን <p>99 ሌላ ከሆነ ይግለጹ</p>	
19	በምን ሰዓት ነው የወባ ትንኝ የሚትነክሰው?	<ol style="list-style-type: none"> 1 ጡዋት 2 ከሰዓት 3 ማታ አልጋ ላይ ከመውጣት በፊት 4 ማታ አልጋ ላይ ከወጡ በኋላ 5 ቀኑን ሁሉ <p>98 አላወቅም</p> <p>99 ሌላ ከሆነ ይግለጹ</p>	

3 የአጎበር አጠቃቀምን የሚጠይቅ መጠይቅ

ተ ቁጥር	ጥያቄዎች	ከድ	ይዘልል
20	በቤትዎ የአልጋ አጎበር አለ?	1 አዎ 2 የለም	
21	አዎ ከሆነ ከዬት አገኙ?	1 ከወረደ ጤና ብሮ 2 ከጤና ጣብያ 3 ከጤና ኬላ ወይም ከክሊኒክ 4 ከሱቅ 5 ከኤንጅኦ 99 ሌላ ከሆነ ይግለጹ	
22	ከፍለው ነዉ የወሰዱ?	1 አዎ 2 አይደለም	
23	አዎ ካሉ በሰንት ያህል ብር?		
24	የቆይታ ጥያቄዎች 24 መልስዎ 1 ጥያቄዎች የአልጋ አጎበር ነዉ ያለዎት? መልስዎ 2 ቁጥር ከሆነ መት ነዉ ያገኙት ቁጥር ከሆነ ወደ ተራ ቁጥር 35 ይህዱ ቀን ወር ዓመት	1 ደግሞ ማከም የሚያስፈልግ 2 ለብዙ ጊዜ ሰይታከም የሚቆይ	
26	እንደምታከም ያዉቃሉ?	1 አዎ 2 አላዉቅም	99 ሌላ ከለ ያብራሩ
27	አዎ ከሆነ ከምን ያህል ወር በኋላ ነዉ ምታከመዉ?		
28	አጎበርዎ ታከሞ ያዉቃል ?	1 አዎ 2 አይደለም 98 አላዉቅም	
29	አዎ ከሆነ ስንቴ መዲኃኒት ተደረገዋል?	1 አንዴ 2 ሁለቴ 3 ሦስቴ 4 ብያንስ አራቴ	
30	አጎበርዎን ለመጨረሻ ጊዜ ካከሙት ምን ያህል ወር ይሆናል?	1 ከስድስት ወር በታች 2 ከስድስት ወር እስከ አስራሁለት ወር 3 ከአስራሁለት ወር በላይ	

31	ማን ነበር ያከመው?	1 በራስዎ 2 ጤና በላሙያ 3 በላሱቅ 99 ሌላ ከሆነ ይግለጹ	
32	አጥበው ነበር?	1 አዎ 2 አይደለም	
33	አዎ ከሆነ ባለፈው ስድስት ወር ውስጥ ስንቴ አጥበዋል?	1 አንዴ 2 ሁለቴ 3 3 እስከ 5 ቴ 4 ስድስቴና ከዚያ ባላይ 5 ምንም	
34	ቶሎ ቶሎ ማጣብ የመከለከሉን አቅም እንድሚቀንስ የዉቃሉ?	1 አዎ 2 አላዉቅም	
35	የአጎበርን ጥቅም የዉቃሉ?	1 አዎ 2 አላዉቅም	
36	አዎ ከሆነ ምን ምን ጥቅሞች አሉት?	1 የወባ ትንኝን ይከለከላል 2 ሌላ ትንኞችን ይከለከላል 3 የወባ በሽታን ይከለከላል 4 ሙቀት ይሰጣል 5 99. ሌላ ከሆነ ይግለጹ	
37	አጎበር የወባ በሽታን እንዴት ይከለከላል?	1 በሰውነት ላይ እንዳይቀመጥ ያደርጋል 2 የወባ ትንኝን በመግደል 3 ትንኙን በማቃጠል 98 አላዉቅም 99 ሌላ ከሆነ ይግለጹ	
38	በአጎበር ወስጥ መተኛት ችግር ያማጣል?	1 አዎ 2 አላዉቅም	
39	አዎ ከሆነ ምን ዓይነት ችግር?	1 ምቹ አላማሆን 2 ይሞቃል 3 ያፍናል 99 ሌላ ከሆነ ይግለጹ	
40	ስለወባ በሽታ ሰምተው ወይም አይተው ያዉቃሉ?	1 አዎ	

		2 አላዉቅም	
41	አዎ ከሆነ ከዩት ሰሙ ወይም አዩ?	1 ከሬዲዮ 2 ከቴሌቪዥን 3 ከጋዜጣ 4 ከጤና በላሙያ 99 ሌላ ከሆነ ይግለጹ	
42	ምን ዓይነት ትምህርት ነዉ የሰሙት?	1 ስለ መከለከል 2 ስለ መተካም 3 ስለ መተላለፍ 4 አለስታዉስም 99 ሌላ ከሆነ ይግለጹ	

4 የአተኛኝት ሁኔታ

43	በቤትዎ አልጋ አለ?	1 አዎ 2 የለም	
44	አዎ ከሆነ በቤትዎ ስንት አልጋ አለ?		
45	በቤትዎ ነፍሰጡር እናት አላች?	1 አዎ 2 የለም	
46	አዎ ከሆነ አልጋ አላት?	1 አዎ 2 የለም	
47	ለነፍሰጡር እናት የአልጋ አጎበር አለ?	1 አዎ 2 የለም	
48	አዎ ከሆነ አጎበሩዎን ትጠቀማላች?	1 አዎ 2 አይደለም	

49	አዎ ከሆነ እንዴት ነበር ስትጠቀም የነበረችሁ?	1 ዓመቱን ሙሉ 2 አልፋ አልፋ	
50	አልፋ አልፋ ከሆነ መች ነበር የሚትጠቀመዉ?	1 ዝናባማ ጊዜ 2 ዝናብ ከጠፋ በኋላ 3 በበልግ ጊዜ 4 እንደፈለገችዉ 5 የወባ ትንኝ ሲትመጣ	
51	ትላንት ማታ ነፍሰጡር እናት አንበር ዉስጥ ተኝታለች?	1 አዎ 2 አይደለም	
52	እቤትዎ ከአምስት ዓመት በታች የሆነ ሕጻን አለ?	1 አዎ 2 የለም	
53	ያለ ከሆነ አልጋ አለዉ?	1 አዎ 2 የለም	
54	ለአምስት ዓመት በታች ለሆነ ሕጻን የአልጋ አንበር አለ?	1 አዎ 2 የለም	
55	አዎ ከሆነ አንበሩን ይጠቀማል?	1 አዎ 2 አይደለም	
56	አዎ ከሆነ እንዴት ነበር ስጠቀም የነበራዉ?	1 ዓመቱን ሙሉ 2 አልፋ አልፋ	
57	አልፋ አልፋ ከሆነ መች ነበር ሚጠቀማዉ?	1 ዝናባማ ጊዜ 2 ዝናብ ከጠፋ በኋላ 3 በበልግ ጊዜ 4 እንደፈለገችዉ 5 የወባ ትንኝ ስትመጣ	
58	ትላንት ማታ ከአምስት ዓመት በታች የሆነ ሕጻን አንበር ዉስጥ ተኝተዋል?	1 አዎ 2 አይደለም	

59	የአምስት ዓመት ሕጻንና የፍሰጡር አጎበር ውስጥ ያልተኙ ከሆነ ለምን?	<ol style="list-style-type: none"> 1 ስለሚሞቅ 2 ትንኙ አሁንም አጎበሩን አልፋ ስለሚትነክስ 3 ማታ ተነስተው እንዳይሄዱ ስለሚከለክል 4 ሁሌ ከአልጋ ጋር ማስተካከል ስለሚያስቸግር 5 በቂ የሆነ አየር ስለማያስገኝ 6 አጎበሩ የወጣን በሽታን ስለማይከለክል 	
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ቼክሊስት

መግቢያ: ይህ ቼክሊስት ከአምስት ዓመት በታች ያለውን የሕጻን እና የፍሰጡር እናት አጎበር ለማያት የተዘገጀ ነው። ሁለትና ከዚያ በላይ የሆነ ከአምስት ዓመት በታች ያለው የሕጻን እና የፍሰጡር እናት የአልጋ አጎበር ካላቸው አንዱን በሎተሪ ሁኔታ ይወሰዱ

ከመተየቱ በፊት: የአባዎራ ፍቃደኝነትን ይጠይቁ

መተየት ያለበት ነገሮች: የተቀደዱ ቦታዎችን ፣ ቀዳዳዎቻችን ፣ በትክክል ተንጠልጠሎ እንዳለ እና የተቃጠሉ ቦታዎችን

መተየት ያለበት ጊዜ: ጡዋት ከአልጋቸው ሰይነሱ

የመተየት ሁኔታ: በትክክል የተቀደዱ ቦታዎችን በሴንት ሜትር መለካት እና ቀዳዳዎችን መቁጠር

ተራ ቁጥር _____

ቦታ ወይም ቀበሌ _____

ተራ ቁጥር	መተያየት ያለበት ሁኔታዎች	ኮድ	ይዘት
60	አጎብሩ	1 የታሸገ 2 የተጠለጠለ 99 ሌላ ከሆነ ይግለጹ	
61	የተጠለጠለ ከሆነ በምን ላይ	1 በአልጋ ላይ 2 በወለለል መተኛ ቦታ ላይ 99 በመደብ ላይ	
62	የአጎብሩ ቅርጽ	1 ሬክታንጉላር 2 ኮንካል	
63	የአጎብሩ መልክ	1 ነጭ 2 አሮንጋዴ ወይም ሰማያዊ	
64	ስንት የአልጋ አጎብሮ አለ?		
65	በአጎብሩ ቀዳዳ አለ?	1 አዎ 2 የለም	
66	ከለ ስንት ቀዳዳ አለ?		
67	ትልቁ ቀዳዳ ምን ያህል ሴንት ሜትር ይሆናል?		
68	በአጎብሩ የተቀደደ ቦታ አለ?	1 አዎ 2 የለም	
69	ከለ ስንት የተቀደደ ቦታ አለ?		
70	ትልቁ የተቀደደ ቦታ ምን ያህል ሴንት ሜትር ይሆናል?		

የወይይት ነጥቦች ለ ፎክስ ጉሩፕ ድስከሽን

ይህ የውይይት ነጥቦች ለነፍሰጡር እናቶች ና ከአምስት ዓመት በታች ሕጻናት ያሉ አባወራዎችን ለመጠየቅ የተዘጋጀ ነው።

መግቢያ: ወደዚህ ወደ ወይይት መድረክ ስለመጡ በጣም እናመሰግናለን የእርስዎ መምጣት ለጥናቱ ወሳኝነት አለው።

የሚሰጡ ሃሳብ፣ አስተያየት ና ውሳኔ ለሚሰረው ሥራ አስታውቶ አላው።፡፡ገንቢ፣ የተለየ ሃሳብን በሙላት መግለጽ ይችላሉ።

እውነት ወይም ውሸት የሚባል መልስ የላውም እና ለተነሱ ሃሳቦች አላመስማምዎትን መናገር ይችላሉ። ፡ ስም፣ዕድሜ፣

የሥራ ሁኔታ፣ ኃላፊነትን እና ሌሎች ነገሮችንም ይግለጹ።

አላማ: የአልጋ አጎበር ጥቅም፣ ውጤት ና ችግሮችን ከእናንቱ ጋር ከዚህ በታች ባሉ ነጥቦች ለመወያየት ነው።

1. የነፍሰጡር እናቶችና ከአምስት ዓመት በታች ያሉ የሕጻናት አተኛኝነት ምን ይመስላል
2. የወባ በሽታ ዋና ችግርዎ ናት ወይ ለምን
3. ለወባ በሽታ ያሉት ዕውቃት አመለካከት እና ሁኔታ ምን ይመስላል
4. የአልጋ አጎበር ስርጭትና ግባአት በእርስዎ አካባቢ ምን ይመስላል
5. በአካባቢዎ ያለ የአልጋ አጎበር ትምህርት ምን ይመስላል
6. እንዴት ነበር ህብራተሰቡ የአልጋ አጎበርን እየተጠቀሙ ይሉት
7. በቤት ውስጥ ከሉ ከቤተሰብ ቅድምያ ሚሰጣዉ እንድጣቀም ለማን ነበር
8. በአልጋ ጎበር ውስጥ መተኛት የሚሰጡ ጥቅሞች አሉ ከለ ይግለጹ
9. በአልጋ ጎበር ውስጥ መተኛት የሚያመጡ ችግሮች አሉ ከለ ይግለጹ
10. አልጋ አጎበር እንዳይጠቀሙ የሚያደርጋቸዉ ችግሮች አሉ ከለ ይግለጹ
11. እቤታቸዉ ያለዉ የአልጋ አጎበር ሁኔታ ምን ይመስላል
12. የወባን በሽታን ለመከላከል አጎበር መጠቀም ለወደፊት ወሳኝ ነው ብለው ያስባሉ

የውይይት ነጥቦች ለቃለ መጠይቅ

1. የወባ በሽታ ጎልቶ የመተየት ሁኔታ ምን ይመስላል
2. የተሸለ የመቆጣጠር ስልቶችና እዉነተዎች
3. የአልጋ አጎበር አፈጻጸም ተቀባይነት እነ ቀጣይነት በአካባቢዎ ምን ይመስላል
4. ከላይ በተጠቀሱ ሁኔታዎች የተሰሩ ጥናቶች አሉ
5. የአልጋ አጎበርን በተመለከተ አሁን እየተሰሩ ያሉ ሥራዎች ምን ይመስላሉ
6. የ እንፎርመሽን ትምህርታዊ እና የመነጋገሪያ ሥራዎች ጥራትና አገልግሎት ምን ይመስላል
7. በቂ የሆነ አቅም ግንባታ ለጤና በላሙያ አለ ወይ
8. የአልጋ አጎበርግባአትን በተመለከተ የገንዘብና የቴክኒካል አቅም ምን ይመስላል
9. የአልጋ አጎበር ምንጭና የስርጭት ሁኔታ ምን ይመስላል
10. በቤታቸዉ ያለዉ የአልጋ አጎበር ሁኔታ ምን ይመስላል
11. ለወደፊት አልጋ አጎበርን በተመለከተ የምሉ ነጥቦች ከለ ይግለጹ

Xa'immakam ogoora enkinisancho.

Hello! Ann -----yammamomo. Anni baxxomok _____
beyyonete yitaa kigaaga chakisee. Elasage soorobim hallata kid yitta kure kachis binbe'e
egelakam bikinaa mat mat xamicha xamenaate. Ohim aligaa agobare awwaxakam duha'e
bikinatee. Mashikaomim kachis jabii egelakam gogo qochimina haramoo bikinatee. Elasage
xamicha xamimminaa hanqo'i manichoo anan isee la'ee . Ohim mi'n anich beelas min amma
te'im mill aginxanch ogor yoo mancho xamee.

Kabaa kutoo woshii kesse te'im mulleka xamisisso googi be'anee. Ebikinna hanqo'I woshaa
esee amaniminee kutonaa lobakatta galaximinee xamoomo. Kaba xamichaa dabatenaa
taphantohoniye.

1 oyaa

2 gatonna

Mi'n ann summa _____ umura _____ firma'a _____

Xamanchi summa _____ firma'a _____

Dadessanch summa _____ firma'a _____

Xamichi xigoo _____

Kebele'e _____

Taphantako'I bikkina Lobakatta galaxomoo!!

AGAA

Kann woroon yooki xamichi hundim gasamma kodi uwammakohane. Xamichom gatti ogoraa annanato, kachis jabii hinkid egelakamda'e, agobaraa awwwaxakam hallata, inssi beyyi duha'a amadakohanee.

- Matti hannan ihakoo ontii hinch worron yoo'I chilluw yollah mattoma hixxo'inee mase
- Danam angi kitabine bon beyoo wonshe
- Mat xamich mat koree xamee
- Dabachinaa amane uwee
- Dabaramu xamicha danamisa isitta xaaxe
- Mat mat higo'i yokk xamichuwaa awonnamako xamichuwaa danamisaa moo'e.
- Mat mat qerra'l amane xammo xamichina cakissimine haramee

D) Gatti ogoraa annanato xamoo xa'imichaa

Xigo	Xamichaa	dabachaa	higonna
1	Umur mee'o		
2	Kihi allibachi mahaa?	1. gonchoo 2 mentichoo	
3	Kihi hechi beyy hanoo?	1 katamaaa 2 gaxaraa	
4	Hayyimanotti mahaa?	1 . protestantaa 2 ortodoxsaa 3 musulimaa 99 mulanee-----	
5	Kihi lossa'n duha'I mahaa?	1 tamarubee'anee 2 qannaana'ma xafi'm xalee'e 3. 1 tii 6 afebe'e tamarakohanee 4 7 rii 10/12 afebe'e 5 collejja te'im universite'e	

6	Mi'n annii baxx mahaa?	1 abulla 2 dadaroo 3 mangisti baxxo 4 ba'l baxxo 99 mu'll baxxo	
7	Mat aga'n woronee siidamoo bi'll gimmit hinkanna ehokko? -----		
8	Mee'i ontii hinch wooron yoo chilluw he'atee?	1 bee'e 2 matoo 3lami hanaane	
9	Kini minenee mee'I abaroos he'atee?	1 4 rii woroon 2 5 tii haanane	
10	Mi'n emaanmmahinee baxamakohanee?	1 korkoro'enee 2 gufinee te'im hixinee 3 mull lkiwinee	
11	Mi'n gortaan mahinee baxamakohanee?	1 buchinee 2 simintoo'inee 3 haqii xalee'inee 99 mullaninee	
12	Axag mahinee gollamakohanee?	1 buchinee 2 simintoo'inee 3 haqii xalee'inee 99 mullaninee	

II) Kachis binbe'enee yook lachaa ,hallataa mo'isoo xamichaa

Xigoo	Xamichaa	Dabacha	Higonaa
13	Kachis jabii mahinee waroda'e laqohoniyyee?	1 oyaa 2 la'omoyoo	
14	Laqollah mahinee waroo?	1 qidinee te'im wo'inee 2 xeeninee 3 shonikoraa shonikora laboo luwaa itiminee 4 sexxaninee 5 kachis binbe'inee 6 wa'I quniqinee 99 mullan ihulas chakisee	

15	Kachis jabii mat manchii mull manchonee higohoniyye?	1 oyaa 2 daballoyyo	
16	Higo'las, hinka'issinee?	1 kachis binbe'inee 2 foshinee 3 jabuu manichoo amadimineee 99 mullan ihullas chakisee	
17	Hiniikaisinete kachis jaboo egelakamoki?	1 diidite'a fugimmine 2 fikkanoo beyyoo bi'isiminee 3 qaararee ggasaka'a masiminee 4 aligg agobaraa awwaximinee 5 la'omoyoo 99 mullan ihullas chakisee	
18	Ayyetee kachis jabi lopa hawodokokki?	1 ontii hinchii woroon yoo chilluwwa 2 lanffor ammo'o 3 qoor manna 4 lomanna 99 mullan ihullas chakisee	
19	Hinkido'I amane kachis binbe'I qassokok?	1 daraa 2 sa'ax lasagee 3 inseakon gassa 4 himi inse'akka'a lasone 5 ball hunda'm 98 la'omoyoo 99 mulan ihullas chakisee	

III) Algii agobarra hinkido'isaa awwaxakamda'e xamoo xamichaa

Xigoo	Xamichaa	Dabachaa	Higonaa
20	Kin minene ara'I agobar yohoniyye?	1 oyaa 2 bee'e	
21	Hanissette sidako'ok?	1 worax birro'I minisee 2 xenna'I xaba'insee 3 killinikinsee 4 siqinsee 5 gill massaraminisee	

22	Bitallaka'a hellako'oniyyee?	1 oyaa 2 bita'amube'anee	
23	Bittalakolas me'I birinettee bita'amukok? -----		
24	Hinkido'I agobaraa yookoki? (dabach xig 2 ihulas xamich 34 afeb'e caale)	1 hund amanem qarraaree hassohanee 2 qarraaree hassobe'anee 99 mullan ihullas chakisee	
25	Xamich 24 na dabach 1 ihullas hinka'I xire sidako'ok?		
26	La'm qarar hasiso'isa laqohoni yee?	1 oyaa 2 la'omoyyo	
27	Oyaa yitlas mee'I aga'n lasonete qarar isamokok?		
28	Agoabar la'm koll qaraq isamma la'ohoniyye?	1 oyaa 2 la'oyoo 98 la'omoyoo	
29	Oyaa yitlas mee'I kore qarar isamma?	1 motti kore 2 la'm kore 3 sas kore 4 hofe'ukuyee soor kore	
30	Lasanch qarar isamukann mee'I agaana ihoko?	1 6 hii agaana woroon 2 6hii- 12 mii agaana 3 12 mii agaana hanne	
31	Ayete la'm ko'll qarare isukkok?	1 anni gag 2 haki'm minene 3 sukane 99 mu'llan ihullas cakise	
32	Agobara ashamma he'ukkonyee?	1 oyaa 2 anshamokkoyo	
33	Oyaa yitllah higu 6 aga'n woroone mee'I kore anshamma?	1 mat kore 2 lam kore 3 3 sii 5 tii kore 4 >=6 kore 5 mate'm kore'm	
34	Kabad kabade anshi'mm egedoo mallayea xa'iso'isa loqohoniyyee?	1 oyaa 2 la'omoyoo	
35	Agoba'l awwado loqohoniyyee?	1 oyaa	

		2 la'omoyoo	
36	Laqo'lah mahinna awwado?	1 kachis binbe'insee egedokoo 2 diriroo horoo foch illichuwa'insee gatisokoo 3 kachis jabii gatisokko 4 ebba uwokko 99 milan ihulas chakisee	
37	Agobar hnkido'isinee kachis jabii egedokkok?	1 orachonee afuroo be'issa horiminee 2 kachis binbe'e shiminee 3 kachis binbe'inna makko be'issa isiminee 98 la'omoyoo 99 mulan ihulas chakisse	
38	Alg agobaraane inse'im hawoo ebohon?	1 oyaa 2 eboyoo	
39	Ebohan ihulas mah hawoo ebokko?	1 makim be'imma 2 ibba 3 fasha efisokoo 99 mulan ihulas chakisse	
40	Kachis jabii bikinna lossa te'm mo'lla laqohonyee?	1 oyaa 2 la'omoyoo	
41	Lako'lah mahinsee te'im hanisee?	1 redo'I 2 televeshinisee 3 gazex te'im ayy kitabamukk maxaff 4 hakimmuwinsee 99 mulan ihulas chakisse	
42	Mah bikkinaa machesa te'm mo'lla He'ukook?	1 kachis jaboo egellakam goqii bikkina 2 qarraaree awwaxakam goqii bikkina 3 kachis jabii higoo goqii bikkina 4 sawenna xanomoyoo 99 mulan ihulas chakisse	

VI) insi beyii duha'I bikinna xamoo xamichaa

43	Kin minene ara'I yoohonoyee?	1 oyaa 2 bee'e	
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44	Yollah, mee'I ara'I he'atee?		
45	Kin minene lanfor mentich yoo'onnyee?	1 oyaa 2 bee'e	
46	Oyaa yitillah ara'i yohonyee?	1 oyaa 2 bee'e	
47	Lanfor mentichona agobar yohonyee?	1 oyaa 2 bee'e	
48	Oyaa yitlah awaxitamullanyee?	1oyaa 2 awaxito'oyoo	
49	Oyaa yitlah hinkidee awaxxitam hello'ok?	1 hinch hunda'm 2 higa'a higa'a	
50	Higa'a higa'a awaxita'mlas hinkido'I amane awaxitamok?	1 xeen yoo amane 2 xeen elle'o amne 3 billo amane 4 hasso amane 5 kachis binbe'I bi'o amane	
51	Himo'o ara'i agobaar woroone insella'a hello'onnyee?	1 oyaa 2 inselo'oyoo	
52	Kin minene ontii hinch woroon yoo chilluw yoohonyyee?	1 oyaa 2 bee'e	
53	Yollah ixg gaqii ara'i yoohonyyee?	1 oyaa 2 bee'e	
54	Oniti hinch woroon yoo chilichina ara'i agobaar yoohonyyee?	1 oyaa 2 bee'e	
55	Oyaa yitilah kaba awaxollanyee?	1 oyaa 2 awaxukkoyo	
56	Oyaa yitlah hinkide awaxa'm he'ukkok?	1 hinch hundam 2 higaa higaa	
57	Higaa higaa awaxo'llah hinkido'I amane awaxokkok?	1 xeen yoo amane 2 xeen elle'o amne 3 billo amane 4 hasso amane 5 kachis binbe'I bi'o amane	
58	Himo'o algi agobaar woroonee inse'a he'ukonyyee?	1 oyaa 2 bee'e	

59	Mahinate agobar woroone inse'ubeek te'im inselo'beek?	1 lobakata iboo bikinaa 2 agobaar he'ukuyam bimbe'I qasoo bikinaa 3 himoo firmaa horoo bikinaa 4 hundi amanem algaa sutim hawisso bikinaa 5 hafach hanqatoo bikinaa 6 agobaar kachis egedoo be'I bikinaa 99 mullan ihullas chahisee	
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10.2 Chekki listaa

Agaa: kuchekki listii onti hinch woroon yoo chilluwka lanfor amo'ika agobara mo'imina gudisamakkohane. Lanforamana onti hinch woroon yoo chilichina mati hannan agobar yollah matoma saminee masee.

Mo'imi gasita: min anni eyitaa xamee

Mo'akam luwwa: dereramu beyyo, affo'uwwa, danamisa calicalada'ee shokada'ee

Mo'akam amane: dara inssi ki'akko'n

Mo'akam hallatta: allo'isa dereramu beyyo sentimetrine kenimma affo'uwwa xigimma

Xamichixigoo _____ Beyoo/qaballe'e _____

xigoo	Mo'm duhaa'a	dabachaa	Higona
60	Agobaar hinkidete yokkok?	1.karammaa afurakkohanee 2. caalicalakohanee 99.mullan ihullas chakisee	
61	Caalicalakohanee ihullas mahanee?	1 ara;ane 2 axagane 99 mullan ihullas chakisee	
62	Agobale'k qooci maha?	1 rectangulara 2 conicall	
63	Agobale'k hagar maha?	1 qadala 2 shano'o	
64	Mee'I agobar he'atee?		
65	Agobanee afo'I yoohonyyee?	1 oyaa 2 bee'e	
66	Oyaa yitillah, me'I afo'I he'atee?		
67	Haraarom me'I senitimetraa ihoo?		
68	Dereraamu beyyi yoohonyyee?	1 oyaa 2 bee'e	

69	Oyaa yitillah me'I beyyi dereraama?		
70	Haraarom me'I senitimetraa ihoo?		

10.3 Galich atoorach duha'a

- 1 Ontii hinch woroon yoo chilichik lanfor mentichik insi beyyi hallat mahaa labokko?.
- 2 Kachis jabbi ayyi jabinse'm araqqii hawodo jabonyyee? Mahinaa?
- 3 Kihii kachis joboo egelakam duha'I bikinaa yook lachii, helatii, baxxi maha labokko?
- 4 Kini ullanee yooki agobar baxanisim ebimi mahaa labokoo?
- 5 Chakise kih hekegonee yokki adoba'l timirtii
- 6 Kini hegeeqi manii agobaraa awwaxim duha'I mahaa labokoo?
- 7 Kini minene agobaraa lux beyonee awwaxokoki ayetee? Mahinaa?
- 8 Agobar woroone inse'im awadi yoohonyee? Mah mah awadii?
- 9 Agobar woone inse'im hawoo ebohonyee? Maha maha?
- 10 Agobaraa awwaximinaa hawisoo gogi mah mahaa?
- 11 Kii mineene yokki agobal duha'I mahaa labokko?
- 12 Agobaraa kaa lasagee awwaxim hasisokko yitaa sawitohonyyee?

10.4 Discussion points (for the in-depth interview)

1. Kachis jabii lobakatissa hawadoo jabii ihukisa
2. Ello jabii gatiso goguwwa bikinaa.
3. Agobar awaximm hallati bikina
4. Kanii hannan yoo duha'I bikina sorobamuk soroph bikinaa
5. Agoba'll bikina kaba baxamuk yoo bax maha labo.
6. Agoba'll bikina informationi,. Lossanni, woco'I halat maha labo
7. Ihakoo lossa'n xenna baxxanina uwama'hiniyee
8. Kaba yook haramatii bi'll duha'I maha labokko
9. Agoba'll baxanisim duha'I waroo beyyi.
10. Kaba minewwanw yokki agobar maha labokko
11. Kanii lassonee isanch hasisso luwi maha labo.

DECLARATION

ASSURANCE OF PRINCIPAL INVESTIGATOR

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the college of public health and medical sciences in effect at the time of grant is forwarded as the result of this application.

Name of the student: - _____

Date. _____ Signature _____

Name of first advisor: - _____

Date. _____ Signature _____

Name of second advisor: - _____

Date. _____ Signature _____

Name of internal examiner: - _____

Date. _____ Signature _____