

# Knowledge and health seeking behavior for malaria among the local inhabitants in an endemic area of Ethiopia: implications for control

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## ABSTRACT

**This cross-sectional study was conducted to assess the knowledge and health seeking behavior for malaria among the local inhabitants in an endemic area of Ethiopia: Implications for control. 98.6% and 80.7% of respondents had awareness about malaria and the cause ('mosquito bite') of malaria, respectively. 186 (81.6%) respondents seek treatment for a febrile disease from health care facilities. Chi-square analysis revealed a strong association between the educational status of respondents and the measures they take to prevent malaria ( $X^2 = 58.7$ ;  $df = 16$ ;  $p < 0.001$ ). The findings clearly suggest that the majority of the respondents had adequate knowledge and enviable health seeking behaviour. However, still a sizable faction had misconception and undesirable health seeking behaviour. It's a major barrier to implement effective malaria control strategies in the resource-limited settings particularly in country like Ethiopia. In this context, appropriate communication strategies apparently inevitable. Therefore, appropriate communication strategies should be designed to promote the knowledge and health seeking behaviour of vulnerable section of the society in this vicinity.**

**Keywords:** Malaria; Knowledge; Health seeking behaviour; Ethiopia

## 1. INTRODUCTION

Malaria remains a major cause of morbidity and mortality in tropical and subtropical regions of the world, despite decades of malaria control efforts. There are ap-

proximately 300-500 million clinical cases and about one million deaths due to malaria globally, and Africa south of the Sahara accounts for over 90% of the disease burden [1]. Most of the infections and deaths in highly endemic areas occur in children and pregnant women, who have little access to health systems [2-4].

109 countries were endemic for malaria in 2008, 45 within the WHO African region. Ethiopia had approximately 6% of malaria cases in the African Region in 2006. Malaria is present everywhere except in the central highlands. A total of 1.2 million cases were reported in 2007, the lowest number in the period 2001-2007 [5]. Over the past years, the disease has been consistently reported as the leading cause of outpatient visits, hospitalization and death in health facilities across the country. The diverse eco-climatic condition in the country makes the malaria transmission pattern seasonal and unstable usually characterized by frequent focal and cyclic widespread epidemics [6].

Except for southern Africa, many countries in the continent do not have successful malaria control programmes due to the magnitude of the problem compounded by lack of adequate health infrastructure, as well as financial and human resources [7]. Vector-borne disease control programs mostly rely on controlling the parasite and/or vector and have often overlooked the importance of the target population's knowledge, beliefs and behavior in the transmission and control of disease [8]. Malaria control programs must consider the broad, complex and interrelated factors that influence human behavior, especially now that malaria control is theoretically within reach of even the poorest countries through the availability of insecticide treated bednets and highly effective antimalarial drug combinations [9].

Malaria protective measures are related to knowledge and beliefs of people; when they think malaria risk is low, it is more difficult to implement protective meas-

ures [10]. The poor and vulnerable populations are disproportionately affected by malaria and the severe consequences of malaria are borne more by the poorest [11]. Studies on knowledge, attitudes and practices are becoming more important to design and improve malaria control activities, to establish epidemiological and behavioral baselines and to identify indicators for monitoring programs [12].

Poor knowledge about malaria was significant factor for death from malaria among the household members in Sudan [13]. Thus, there is an urgent call for updated information on key sociocultural, socio-economic indicators and human understanding about malaria to apply appropriate control strategies. Therefore, the purpose of this study was to assess the knowledge and health seeking behavior for malaria among the local inhabitants in an endemic area of Ethiopia: Implications for control. The present study findings could provide baseline information to design effective and sustainable malaria control strategies suited to local conditions in the near future.

## 2. MATERIALS AND METHODS

### 2.1. Study Settings

The study was conducted in Serbo town, which is located 345km south-west of the capital Addis Ababa in Oromia Regional State, south-western Ethiopia. It's located between latitudes 7°35-8°00 N, and between longitudes 36°46-37°14 E, at altitudes between 1,740-2,660 m above sea level and has a mean annual temperature of 19°C. According to the 2005 census, the study area had a total population of 6,115 and 511 households. Malaria is the major health problem in the Serbo town. As the six consecutive years data (2002-2007) from Serbo Health Center showed, the number of malaria cases ranged between 3,925 and 22,938, with the peak being during 2004/5. The prevalence seems decreasing although the number of cases per year is still high [14]. The main socio-economic activities of the local communities are small business, subsistence mixed farming involving the cultivation of staple crops (maize, teff and sorghum), and cattle and small stock raising.

### 2.2. Study Design

The study was a descriptive cross-sectional survey. A structured questionnaire was designed and administered by trained field workers. The first part of the questionnaire included sociodemographic characteristics, whereas the second part had questions on, adult residents' knowledge and perceptions about malaria transmission, cause, treatment seeking patterns, preventive measures and practices. To improve the quality of the data, pre-testing

of the questionnaire was carried out prior to the actual data collection. The questionnaire was tested on ten respondents by the enumerators, in an area different from the study area, but with a similar socio-demographic pattern.

### 2.3. Data Collection

The questionnaire was administered to 228 randomly selected households between January and March 2009. The head of household or a responsible adult was interviewed. Only one person per household was interviewed. To minimize bias information and variables the questionnaire prepared in English language was translated into native local language Amharic to make it easy to understand and to administer by interviewers and interviewees.

### 2.4. Ethical Considerations

The study was approved by the ethical clearance committee of the Jimma University, Jimma, Ethiopia. Before the commencement of the survey, meetings with community health workers, community leaders and members of the neighborhood associations were held in which the objectives of the survey were clearly explained. Written consent was obtained from each study participant. Every participant was assured to withdraw the interview at any phase if they wish to do so. However, all the informants actively involved and no one declined to finish the interview.

### 2.5. Statistical Analysis

Statistical analysis was carried out using SPSS, version 9.0. Range and mean were analysed and appropriate tables, graphs and percentage were displayed. Level of significance also determined by using 95% of confidence intervals and *p*-value.

## 3. RESULTS

### 3.1. Characteristics of Study Population

The socio-demographic characteristics of respondents are presented in **Table 1**. The study participants consisted of 46.5% males and 53.5% females. Majority of the respondents (44.3%) were in between 20-29 years old. 33.5% of the study population had no formal education. About 34.7% of the participants monthly income was 20-30 USD (**Table 1**).

### 3.2. Knowledge and Perceptions of Respondents about Malaria Cause, Transmission and Mosquitoes Breeding Sites

**Tables 2** presents respondents awareness about malaria

**Table 1.** Socio-demographic characteristics of study population.

| Socio-demographic characteristics       | n   | %    |
|---|-----|------|
| <b>Sex</b>                              |     |      |
| Male                                    | 106 | 46.5 |
| Female                                  | 122 | 53.5 |
| <b>Age</b>                              |     |      |
| 15-19                                   | 37  | 16.2 |
| 20-29                                   | 101 | 44.3 |
| 30-39                                   | 54  | 23.7 |
| 40-49                                   | 21  | 9.2  |
| ≥50                                     | 15  | 6.6  |
| <b>Ethnicity</b>                        |     |      |
| Oromo                                   | 136 | 59.6 |
| Amhara                                  | 34  | 14.9 |
| Gurage                                  | 13  | 4.9  |
| Tigray                                  | 8   | 3.5  |
| Kaffa                                   | 16  | 7.1  |
| Dawuro                                  | 23  | 10.0 |
| <b>Educational status</b>               |     |      |
| Illiterates                             | 81  | 35.5 |
| Can read & write                        | 26  | 11.4 |
| 1-4th grade                             | 32  | 13.6 |
| 5-8th grade                             | 51  | 22.4 |
| 9-12th grade                            | 23  | 10.1 |
| >12th grade                             | 16  | 7.0  |
| <b>Occupational status</b>              |     |      |
| Civil servants                          | 32  | 14   |
| Merchants                               | 84  | 36.8 |
| Housewives                              | 41  | 18.0 |
| Farmers                                 | 53  | 23.3 |
| Private sector worker                   | 12  | 5.3  |
| NGO worker                              | 6   | 2.6  |
| <b>Monthly income (Ethiopian Birr)*</b> |     |      |
| < 100                                   | 31  | 13.6 |
| 101-200                                 | 53  | 23.3 |
| 201-300                                 | 79  | 34.7 |
| 301-400                                 | 33  | 14.5 |
| 401-500                                 | 20  | 8.8  |
| > 500                                   | 12  | 5.1  |

Note\*: 1\$ = 12.4 Ethiopian Birr.

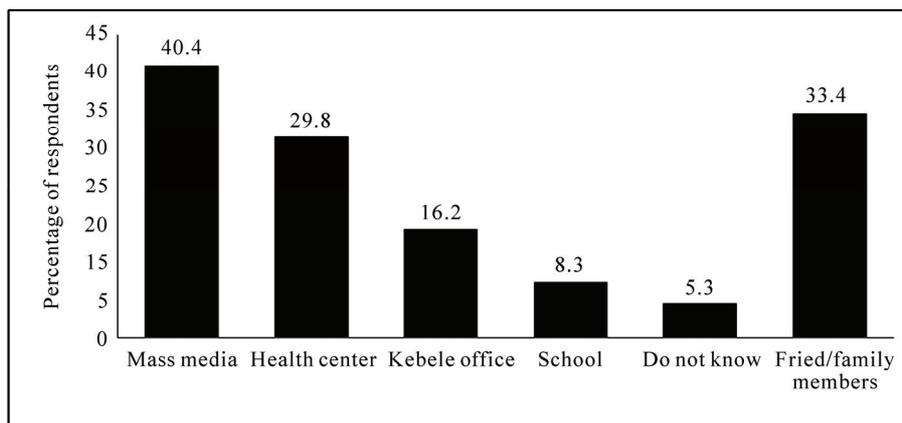
transmission, cause, and mosquito breeding sites. In general, 98.6% of respondents had awareness about malaria. Majority of respondents (80.7%) were aware about the cause ('mosquito bite') of malaria irrespective of sex, age, monthly income and occupation. During the survey, 80.7% of the respondents knew that mosquitoes are transmitting the malaria. A total of 178 (78.1%) people knew that stagnant water bodies are serving as mosquito's breeding sites (**Table 2**). About 40.4% of respondents had known about malaria through mass media (**Figure 1**).

### 3.3. Knowledge and Perceptions of Respondents Regarding Malaria Prevention and Control

**Table 2.** Respondents knowledge and perception about malaria causes, transmission and mosquito breeding sites.

| Variables                         | n   | %    |
|-----------------------------------|-----|------|
| <b>Awareness about malaria</b>    |     |      |
| Yes                               | 224 | 98.6 |
| No                                | 4   | 1.4  |
| <b>Causes of malaria*</b>         |     |      |
| Mosquito bites                    | 184 | 80.7 |
| Chill climate                     | 167 | 73.2 |
| Malnutrition                      | 96  | 42.1 |
| Eating raw vegetable              | 71  | 31.1 |
| Drinking dirty water              | 123 | 54   |
| I don't know                      | 46  | 20.2 |
| <b>Malaria transmission*</b>      |     |      |
| Cold weather                      | 101 | 44.3 |
| Mosquitoes bites                  | 184 | 80.7 |
| Heat/Sun shine                    | 23  | 10.1 |
| Dirty stagnant water /swamp       | 106 | 46.5 |
| Due to poor personal hygiene      | 102 | 44.7 |
| Starvation                        | 46  | 20.2 |
| <b>Mosquitoes breeding sites*</b> |     |      |
| Stagnant water                    | 178 | 78.1 |
| Tree holes                        | 29  | 12.7 |
| Waste/polluted water              | 43  | 18.9 |
| Stream/River                      | 26  | 11.4 |
| Dirty places/Dustbin              | 97  | 42.5 |
| I don't know                      | 22  | 9.6  |

Note\*: Percentages do not add up to 100 due to multiple responses.



**Figure 1.** Sources of information about malaria related information as reported by respondents.

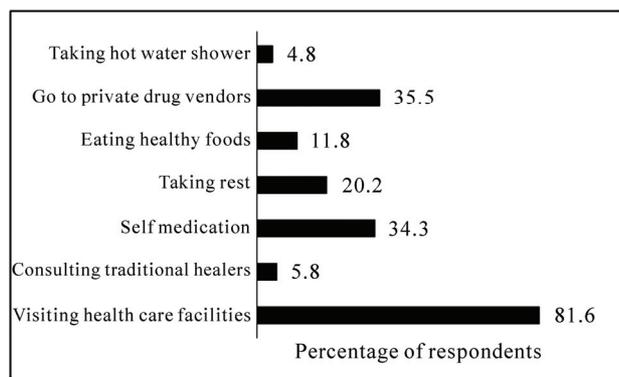
95.6% and 77.2% of respondents believe that regular deployment of bednets and DDT indoor residual spray (IRS) could prevent malaria, respectively (**Table 3**). Chi-square analysis revealed a strong association between the educational status of individual households and the measures they take to prevent malaria ( $X^2=58.7$ ;  $df=16$ ;  $p < 0.001$ ) (**Table 4**).

### 3.4. Febrile Disease Treatment Seeking Behavior of Respondents

As shown in **Figure 2**, 186 (81.6%) respondents seek treatment for a febrile disease from the health care facilities. However, few respondents cited such as self medication, approaching traditional healers and eating health foods.

## 4. DISCUSSIONS

This study sheds light on a group of adults in a malaria endemic area of Ethiopia regarding the level of understanding community knowledge about malaria and health seeking behavior. It provides information for



**Figure 2** Treatment-seeking behaviors for febrile disease as reported by respondents.

educators and policy makers that are necessary for guidance towards malaria preventive campaigns. In the present survey, majority of the study participants (98.6) demonstrated general awareness about malaria, which is relatively higher than a recent study, which was conducted in Swaziland showed that of 320 households surveyed 298 (93.1%) of the respondents had heard about malaria [15]. This discrepancy could be because of the fact that usually the population in malaria endemic settings has higher awareness than the residences of en-

**Table 3.** Respondents knowledge and perception about malaria prevention and control.

| Variables   | n   | %    |
|---|-----|------|
| <b>Possible options to prevent/control malaria*</b> |     |      |
| Residual house spraying with DDT                    | 176 | 77.2 |
| Environmental management                            | 112 | 49.1 |
| Regular deployment of bednets                       | 218 | 95.6 |
| Early diagnosis and treatment                       | 22  | 9.6  |
| Personal hygiene                                    | 79  | 34.6 |
| Healthy food/Nutrition                              | 92  | 40.3 |
| <b>Benefits of IRS</b>                              |     |      |
| To prevent from malaria /mosquito bite              | 126 | 55.3 |
| To avoid bites from other insects                   | 84  | 36.8 |
| I don't know  | 18  | 7.9  |
| <b>Benefits of ITNs/Bednets*</b>                    |     |      |
| To avoid insects bites                              | 221 | 96.9 |
| To prevent malaria and other diseases               | 213 | 93.4 |
| I don't know  | 3   | 1.4  |
| To kill domestic insects                            | 5   | 2.2  |

Note\*: Percentages do not add up to 100 due to multiple responses.

**Table 4.** Association between mosquito preventive measures and educational status of the respondents.

| Types of prevention measures | Total respondents | Educational level of the respondents |                  |             |              |             | p-value       |
|------------------------------|-------------------|--------------------------------------|------------------|-------------|--------------|-------------|---------------|
|                              |                   | Illiterates                          | Can read & write | 1-8th grade | 9-12th grade | >12th grade |               |
| Mosquito net                 | 57                | 16                                   | 9                | 13          | 10           | 9           |               |
| DDT spraying                 | 52                | 3                                    | 12               | 22          | 8            | 7           | $X^2 = 58.7$  |
| Draining stagnant water      | 93                | 41                                   | 19               | 28          | 5            | 0           | $df = 16$     |
| Don't use                    | 13                | 13                                   | 0                | 0           | 0            | 0           | $p < 0.001^*$ |
| Burning repellent plants     | 13                | 8                                    | 4                | 1           | 0            | 0           |               |
| <b>Total</b>                 | <b>228</b>        | <b>81</b>                            | <b>44</b>        | <b>64</b>   | <b>23</b>    | <b>16</b>   |               |

Note\*:  $p < 0.05$  statistically significant

demic/nonendemic area. In addition this study was conducted in urban area too.

80.7% of the respondents knew the role of mosquitoes in malaria transmission ('mosquito bite'). The respondents' level of awareness about mode of malaria transmission was very low when compared to the findings in previous studies carried out in Ethiopia which reported awareness levels of up to 93% [16,17]. However, it's relatively higher than that reported in other studies 55% of the surveyed population in a nationwide study in Malawi (Ziba *et al.*, 1994) [18], 67% in Turkey [19], and 17.3% in Ethiopia [20,21].

However, many people had not known the real cause of malaria. Such misconceptions have also been reported from other studies in Ethiopia and other countries [22-24]. The present study findings were comparable with previous studies in India [25] and in Ethiopia [17] although the association of malaria with mosquitoes is widespread in these communities, other causal factors of malaria such as traditional beliefs like eating maize stalks, contact with malaria patients, exposure to rains and cold weather, bad smell and dirty water were frequently suggested. The correction of such misconceptions about the relationship between mosquito bite and malaria through health education messages is very critical for the success of malaria prevention and control using ITNs [26].

78.1% of respondents indicated that stagnant water bodies serving as potential mosquito breeding sites. Previous studies in Ethiopia have also confirmed similar findings [17,27]. However, the level of awareness regarding mosquito breeding site was relatively lower than earlier studies. Most of the respondents knew about malaria related information through mass media and friends/family members. Findings were consistent with a study in Ethiopia [17]. The most common source of information about malaria was from relatives. Radio was ranked third after medical personnel as a major information source [28].

The great majority of the respondents believe that

regular deployment of bednets and DDT indoor residual spray (IRS) could prevent insect's bites and malaria. The findings comparable with an earlier study in Mozambique demonstrated that the majority of respondents associate malaria with mosquitoes and are aware of various methods to prevent illness, including IRS and bed nets [29]. **Table 4** Chi-square analysis suggest an association between the educational status of individual households and the measures they take to prevent malaria ( $X^2 = 58.7$ ;  $df = 16$ ;  $p < 0.001$ ). Results consistent with an earlier study, which was conducted in Swaziland, found that most respondents believed that malaria is preventable, and mentioned clinic, spraying and the use of bed nets as key malaria preventive measures. Despite these positive responses a substantial number of them (43.4%) did not take any personal protective measures against malaria infection [15]. Indeed, several studies across the globe particularly in Africa evidently suggest that Bednets/Insecticide-treated nets are regarded as one of the most effective prevention methods and sleeping under the protection of bednets could substantially reduce the malaria burden.

Another interesting finding was that the majority of the respondents preferred to seek treatment in the health facilities rather than approaching traditional healers and self medication. This may be due to the fact that the Serbo health center is located within the study area as result accessibility is extremely high among the local inhabitants. In addition, it's providing services free of charge. The present study findings are comparable with few earlier studies. In Ethiopia, 98% respondents had their first visit to health care facilities including public and private health services as well as malaria control laboratories, drug venders/pharmacy and CHWs seeking treatment for malaria [17]. Another study in Swaziland found that almost 90% of the respondents seek treatment in the health facilities [15].

The scope of malaria control is changing worldwide. With less emphasis being placed on insecticide use, in-

creased community participation in malaria control and prevention measures will be of higher importance. With greater emphasis being placed on community control and prevention, health education based on understanding community and individual behaviors, attitudes and knowledge pertaining to malaria is moving to the forefront as a measure necessary for malaria control [30].

The present study findings clearly suggest that the majority of the study participants had adequate knowledge and ample enviable health seeking behavior. However, still a sizable proportion had misconception and undesirable health seeking behavior. Indeed, it's a major barrier to implement effective as well sustainable malaria control strategies in the resource-limited and ethnically-diverse settings particularly in country like Ethiopia. Therefore, appropriate communication strategies should be designed and implemented in the study area to bring the constructive outcome in the near future.

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