

## Research Article

# Treatment Seeking Behavior and Associated Factors Among Malaria Suspected Patients in Bale Zone, Southeast Ethiopia: Institution-Based Cross-sectional Study

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## Abstract

**Introduction:** Seeking the treatment within twenty four hours from the first symptom and effective treatment are important for controlling the transmission of malaria. But there is no study done on treatment seeking behavior of malaria patients. Thus, this study aimed to assess treatment seeking behavior and associated factors among malaria suspected patients in Bale Zone, Southeast Ethiopia.

**Materials and Methods:** An institution-based cross-sectional study design was employed among three hundred eleven malaria suspected patients in malaria endemic public health institutions of Bale Zone, Southeast Ethiopia in March, 2014. Proportionally allocated sample size was collected consecutively until the required sample size fulfilled from eleven health institutions providing microscopic diagnostic test for malaria patients. The data were analyzed using SPSS. Descriptive statistics, binary and multiple logistic regressions were employed to identify those factors that determined treatment seeking behavior.

**Result:** From the total respondents (297) fully responded to the survey 87.8% (260) of them did not seek treatment within the recommended first 24 hours from onset of illness. 15.2% (45) of the patients sought treatment from non-medical center before coming to the health institution. Perceived susceptibility for malaria and having knowledge of mosquito nets as means of mosquito bite prevention were independently associated with treatment seeking behavior. Those respondents who had low perceived susceptibility of malaria diseases sought 0.24 times less likely when compared with those respondents who perceived malaria as a deadly disease (AOR= 0.24; CI 95%: 0.07-0.85)

**Conclusion:** Majority of the respondents did not seek treatment for the disease within the right time, which is from the first onset of symptoms. Perceived susceptibility for malaria disease was the best predictor for the respondents to sought treatment early. On the other hand delayed in seeking treatment behavior is alarming to health institution, district health office and health extension workers as this will enhance malaria transmission. Thus, malaria prevention and control program should focus these identified factors.

**Keywords:** Malaria; Treatment seeking behavior; Associated factors

## Background

Malaria is a preventable and treatable mosquito-borne disease, whose main victims are children under five years of age in Africa [1, 2]. The symptoms of malaria can be non-specific but fever is its cardinal symptom. The fever is often accompanied by headache, chills, rigors, myalgia, arthralgia, anorexia, nausea and vomiting. Malaria should be suspected in patients residing in endemic areas and presenting with above symptoms [3]. Malaria control requires an integrated approach, comprising prevention and treatment with effective anti malarial agents. The provision of prompt and effective treatment is the cornerstone of malaria case management and in reducing severe morbidity and mortality from the disease [4].

According to the latest World Health Organization (WHO) estimates, there were about 219 million cases of malaria in 2010 and an estimated 660 000 deaths. Africa is the most affected continent: about 90% of all malaria deaths occur there [2, 5].

Ethiopia is one of the most malaria epidemic-prone countries in Africa [6]. Despite the low malaria parasite prevalence compared to many African countries, malaria remains the leading communicable disease seen at health facilities in Ethiopia. About 75% of the geographic area of the country has significant malaria transmission risk (defined as areas <2,000 m), with about 68% (57.3 million) of the country's total population living in these areas. Malaria is ranked as the leading communicable disease in Ethiopia, accounting for about

30% of the overall Disability Adjusted Life Years lost. According to the Ethiopia Federal Ministry of Health (FMOH), malaria was the leading cause of outpatient visits and health facility admissions in 2009/2010, accounting for 14% of reported outpatient visits and nearly 9% of admissions. Malaria was also among the ten leading causes of inpatient deaths among children less than five years of age [7].

Oromiya Regional State has about one-third of Ethiopia's malaria burden, population and land area [7]. In the year 2011, from the total 441, 058 malaria suspected cases, 160,191 of them were confirmed for all species of malaria resulting with 51 deaths [8].

Ensuring prompt and effective treatment will prevent most cases of uncomplicated malaria from progressing to severe and fatal illness. To avoid this progression, treatment must begin as soon as possible, generally within 24 hours after symptom onset. Communities should be aware of the importance of seeking early diagnosis and treatment and adhering to prescribed drug regimens for malaria [9].

Malaria is curable if effective treatment is started early. Delay in treatment may lead to serious consequences including death. Prompt and effective treatment is also important for controlling the transmission of malaria [3]. However, in Bale Zone there hasn't been any study that addresses treatment seeking behavior of malaria patients that would play role in malaria prevention and control. Thus this study assessed treatment seeking behavior and its associated factors among malaria suspected patients in Bale Zone, Oromiya Regional State Southeast Ethiopia.

## Materials and Methods

### Study design and setting

An institutional-based cross-sectional study was conducted in malaria endemic area of public health institution in Bale Zone in May, 2014. Bale Zone is found in Oromiya Regional State at 430km away from Addis Ababa to the Southeast, Ethiopia. The total population of the zone is 1,708,910. 711,523 (42%) of population live in malaria endemic area. It is the largest zone of Oromiya Regional State with surface area of 62,555 km<sup>2</sup>. The zone is composed of 14.92% highland, 21.53% midland and 63.55% lowland with an altitude of 300–4,377 km and annual rainfall of 900–1,400 mm. The zone has eighteen rural districts and three administrative towns. Fifteen of the districts and one administrative town of the Zone were malaria endemic area. These malarious districts had 28 health facilities providing blood film for malaria suspected patients [10].

### Sampling and participation

All febrile patients sought treatment from health facility were the source population whereas suspected malaria patients who were sent for blood film to laboratory department during the study period were study population. Sample size included in the study was determined using single population proportion formula with the assumption of: level of confidence of the study 95%, margin of error 5% and proportion of malaria cases visiting laboratories within two days of onset of illness 25.5% [11]. Using last years' malaria cases load identified in each health facility, the sample size was allocated proportionally for eleven health facilities that were selected randomly from the 28 facilities. The proportional samples allocated for each

health facility were collected from all eligible patients consecutively until sample fulfilled during the study period.

### Instruments and data collection methods

Structured questionnaire covering treatment seeking behavior and associated factors like socio-demographic variables, malaria related variables, perceived susceptibility for malaria, perceived severity of malaria and attitudes toward health institution services was adapted using health belief model as a guide by reviewing different literatures that were pertinent to the topic [2, 3, 11-14]. In addition to health belief model, for some variables other similar study variables were considered. There were seven questions each for perceived severity of malaria, perceived susceptibility of malaria and attitudes toward health facility that were assessed using Likert Scale Method. There were also eleven knowledge questions. The mean scores for both perception construct were computed and dichotomized into high and low. Respondent scores below the mean were labeled as having low perception of severity and susceptibility and those respondents who score mean and above categorized into high perceived severity and susceptibility of malaria disease. Similarly, respondents who score below and above the mean for attitude questions were classified into unfavorable and favorable attitude toward health facility respectively. Concerning the knowledge questions, those respondents who answered seven and above correctly were labeled as good knowledge and who answered incorrectly more than five questions were categorized into poor knowledge.

The questionnaire was translated to local language – Afan Oromo and retranslated to English language to check its consistency by language expertise. To check an internal consistency of the variables under perception, attitude and knowledge Cronbach's alpha coefficients was used. A 0.7 was considered for its lower limit. The data collectors were trained on data collection process for two days. Data were collected through interviewer administered questionnaire. Pretest was conducted two weeks prior to the main study on 5% of the sample size among similar subject in two health facilities that were not selected for the actual study and amendments were made accordingly.

### Operational definition

Treatment seeking behavior: recognition of signs and symptoms of malaria and self referral for treatment; Early treatment seeking behavior: early recognition of symptom(s) and self referral for malaria disease with in twenty four hours of the first symptom(s) (fever); Delayed treatment seeking behavior: seeking the treatment after twenty four hours of first symptom(s) recognition.

### Data management and analysis

The data were entered into EpiData 3.1 after 10% double entry was made and exported to SPSS version 16.0 for analysis. Descriptive, binary and multiple logistic regressions were used to assess factors associated with delay or early treatment seeking behavior; a corresponding p-value of <0.05 was considered to be statistically significant.

### Ethical consideration

Ethical issue was approved by Madawalabu University Ethical Review Committee. A supportive letter was obtained from the

**Table 1:** Socio-demographic characteristics of malaria suspected patients in Bale zone Southeast Ethiopia, May, 2014.

Variables	Frequency	
	Number (297)	Percent (%)
Accountability of the respondent in the family		
Father	117	39.4
Mother	81	27.3
Son	49	16.5
Daughter	32	10.8
Grand family	13	4.4
Other relatives	5	1.7
Sex		
Male	175	58.9
Female	122	41.1
Age		
<=14	21	7.2
15-24	95	32.4
25-34	78	26.6
35-44	61	20.8
45-54	25	8.5
≥55+	13	4.4
Educational status		
No education	126	42.4
Primary (1-8)	132	44.4
Secondary (9-12)	25	8.4
Certificate and above	14	4.7
Occupation		
Farmer	131	44.1
Merchant	23	7.7
Employee	17	5.7
Daily laborer	7	2.4
Students	64	21.5
House wife	52	17.5
Other	3	1.0
Ethnicity		
Oromo	278	93.6
Sumale	9	3.0
Amhara	9	3.0
Other	1	0.3
Religion		
Muslim	259	87.2
Orthodox Christian	29	9.8
Protestant Christian	7	2.4
Wakefana	2	0.7
Time the elapse to reach health facility from their home (km)		
2km ~ <1/2hr	85	30.9
2-5km ~ ½-1hr	74	26.9
>5km ~ >1hr	116	42.2
Average monthly income ( ETB – Ethiopian Birr) (1ETB ~ \$0.051)		
<500	97	36.6
501-999	50	18.9
≥1000	118	44.5

University Research Directorate to all health institutions. Explaining the purpose of the study, verbal consent was obtained from the participants whose age were fifteen and above respondents. For under fifteen years old patients ascent was sought from the parents for providing the information about them. In the case of patients whose

age was 15-17 years old, permission was sought from their family and information for the survey was provided by the patients themselves. The respondents had the right to fill-up or refuse the questionnaire at all or partially. All the information given by the respondents has been used for research purposes only; and confidentiality was maintained by omitting the name of the respondents.

## Result

### Socio-demographic characteristics of the respondents

A total of two hundred ninety seven malaria suspected patients who participated in the study has a response rate of 95.5%. The median age of the respondents was 28 years with the standard deviation of  $\pm$  13.7. Majority of the respondents 87.2% (259) were Muslim religion followers followed by orthodox Christianity 29(9.8%). Regarding their educational status 132(44.4%) has attended primary school. The time elapsed to reach the health facility was >1 hour among 42.2% (116) of the respondents (Table 1).

### Treatment seeking behavior and measures taken for malaria prevention and control

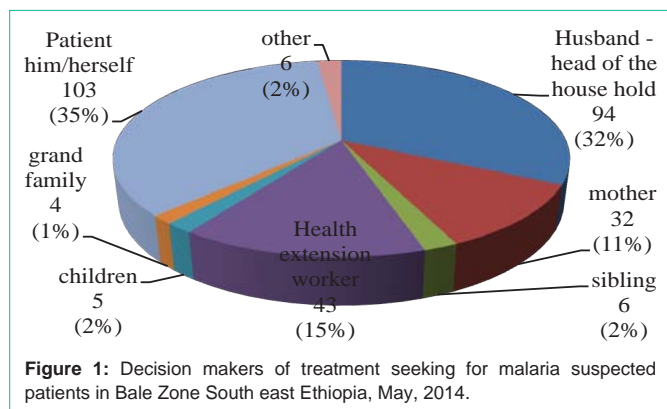
From the total respondents (297) visited laboratory department of the health facilities for blood film, 15.2% (45) of the patients sought treatment from non-medical center (spiritual and/or traditional healers) before coming to the health institution. Majority 87.8% (260) of the respondents did not seek treatment within the recommended first 24 hours of onset of illness.

Of the total respondents, only 37% (110) of them had mosquito net in their home which was given to them three years ago. But from all patients who had mosquito net in their home, only less than half 45.5% (50) of them slept under it. This means, from the total patients who visited the laboratory of the health facility for blood film only 17% of them use mosquito nets to prevent themselves from mosquito bite. In a similar manner, for malaria prevention and control, from the total patients visited laboratory department for blood film, only half 51.3% (141) of them got indoor house sprayed of DDT. Of the total indoor house sprayed house, only 66% (93) them were sprayed with in the last six month that were effective in protecting mosquitoes.

Patient themselves, head of the house hold (husband), health extension workers and mothers were the decision makers in decreasing the urge of the respondents to sought treatment from the nearby health center or hospitals (Figure 1).

### Factors associated with treatment seeking behavior of the respondents

To identify factors associated with treatment seeking behavior of malaria suspected patients in malaria endemic public health institution of Bale zone, bivariate logistic regression was used and multivariate logistic regression was applied to identify the predictors of treatment seeking behavior at p-value less than 0.05. Consequently, there were no significant variables from socio-demographic characteristics of the respondents were identified. However, attitude of the respondents toward health facility services, perceived susceptibility for malaria, perceived severity of malaria, knowledge of using mosquito nets can prevent from mosquito bites and having health information to visit health facility if fever occurs were significantly associated with treatment seeking behavior of the respondents. Those respondents who had unfavorable attitude toward health facility services sought



0.30 times less likely when compared with respondents who had favorable attitude toward health facility services they visited (COR= 0.30; CI 95%: 0.15-0.63). Those respondents who had low perceived severity of malaria disease sought 0.37 times less likely when compared with respondents who perceived that malaria is a deadly disease (COR= 0.37; CI 95%: 0.18-0.78) (Table 2).

When factors associated with treatment seeking behavior adjusted for their confounding factors: only attitude of the respondents toward health facility services, perceived susceptibility for malaria and knowledge that mosquito nets can prevent from mosquito bites were independently associated with treatment seeking behavior of

the respondents. Those respondents who had unfavorable attitude toward health facility services sought 0.21 times less likely when compared with respondents who had favorable attitude toward health facility services they visited (AOR= 0.21; CI 95%: 0.12-0.57). Those respondents who had low perceived susceptibility of malaria diseases sought 0.24 times less likely when compared with respondents who perceived that malaria is a deadly disease (AOR= 0.24; CI 95%: 0.07-0.85) (Table 2).

### Discussion

This study assessed treatment seeking behavior and associated factors among malaria suspected patient in malaria endemic public health institution, Bale zone, Oromiya Regional State, Southeast Ethiopia [15].

Usage of treatment from non health facility like of 'tsebel', home remedy & sought treatment from traditional healers were identified among 15.2% (45) malaria suspected patients. Malaria patients of Sudan population also sought for their diseases from traditional medicine, herbs and self-treatment [16]. In Assam India, also only 60.3% of febrile patients directly came to the public health facility while 23.4% of them sought treatment from untrained village level practitioners and traditional practitioners [17].

Majority 87.8% (260) of the respondents sought treatment after 24 hours of onset of illness which implies, in this study respondents

**Table 2:** Factors associated with treatment seeking behavior of malaria suspected patient in Bale Zone Southeast Ethiopia, May, 2014.

Factors		Treatment seeking time		COR [95%C.I.]	AOR [95%C.I.]
		<=1day	>1day		
Sex	Male	22	153	1.09 (.54-2.25)	
	Female	14	107	1.00	
Educational status	No education	51	75	1.47 [0.49 - 4.45]	
	Primary (1-8)	79	52	0.67 [0.22 - 1.99]	
	Secondary (9-12)	17	8	.47 [0.12-1.80]	
	Certificate and above	7	7	1.00	
Distance from health facility	2km ~ <1/2hr	6	79	1.00	
	2-5km ~ 1/2-1hr	9	64	1.96[0.73-5.27]	
	>5km ~ >1hr	15	101	1.06[0.44-2.56]	
Attitude toward health facility (7 items with Cronbach's Alpha =0.71)					
	Unfavorable	23	91	0.30[0.15-0.63]*	0.21[0.12-0.57]*
	Favorable	13	169	1.00	1.00
Perceived susceptibility for malaria (7 items with Cronbach's Alpha =0.72)					
	Low	24	125	0.46[0.22-0.97]*	0.24[0.07-0.85]*
	High	12	135	1.00	1.00
Perceived severity of malaria (6 items with Cronbach's Alpha =0.71)					
	Low	24	111	0.37[0.18-0.78]*	0.57[0.09-3.75]
	High	12	149	1.00	1.00
Malaria knowledge (12 items with Cronbach's Alpha =0.74)					
	Poor knowledge	12	69	1.38[0.66-2.92]	
	Good Knowledge	24	191	1.00	
Do you think mosquito nets are effective in controlling mosquito bites					
	Yes	7	140	1.00	1.00
	No	19	49	0.12[0.05-0.33]*	0.03[0.01-0.17]*
	I don't know	10	70	0.35[0.13-0.96]*	0.16[0.03-0.90]*
Got health information to visit health facility if had ever					
	Yes	6	66	2.95[1.01-8.59]*	2.70[0.71-10.31]
	No	11	41	1.00	1.00

\*P-value < 0.05

delayed more compared to other malaria patients of rural Ethiopia which were (76%). Among those who sought any type of treatment, only 13% had sought treatment within the first 24 hours of onset of illness. Among rural Ethiopian febrile patients, there were no significant differences in the timing of the first treatment by age which was similar with this study [3].

In Coastal South India, only (6.2%) of the population use mosquito net which is lower compared to this study where 17% of the respondents used mosquito net to prevent themselves from mosquitoes bite. This might be because of difference in study period and socio-demographic difference of the respondents [16].

In this study there were no independently associated socio-demographic variables with treatment seeking behavior of the respondents. Among Kenyan malaria patients also educational level, wealth index, distance from medical facility did not affect the likelihood of seeking treatment at a medical center or within one day of symptom onset. This is consistent with this study [18]. But, in Myanmar Asia, among Wa Ethnic Minority, average yearly income was independently associated with treatment seeking behavior [4].

## Conclusion and Recommendation

Majority of the respondents of this study sought did not seek treatment for their diseases within the right time of first onset of symptoms. Attitude of the patients toward health facility services and perceived susceptibility of patient for malaria disease were the most significant predictors for the respondents to sought treatment as early as possible. Socio-demographic characteristics could not be the factors for early or delay treatment seeking of the patients.

To sustain malaria prevention and control extensive work, it is expected to change perception of the community on malaria through health education using scenario and fear appeal message. Zonal health office in collaboration with Woreda Health Office and Health Institution should identify and improve their services for which majority of the patients have delayed time in seeking treatment of the disease.

## Authors' Contributions

ND & BD conceived and designed the study and analyzed the data. AA assisted the design and the analysis. ND drafted and critically reviewed the manuscript. BD reviewed the manuscript. All authors have read and approved the final manuscript.

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